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WORLD PETROLEUM

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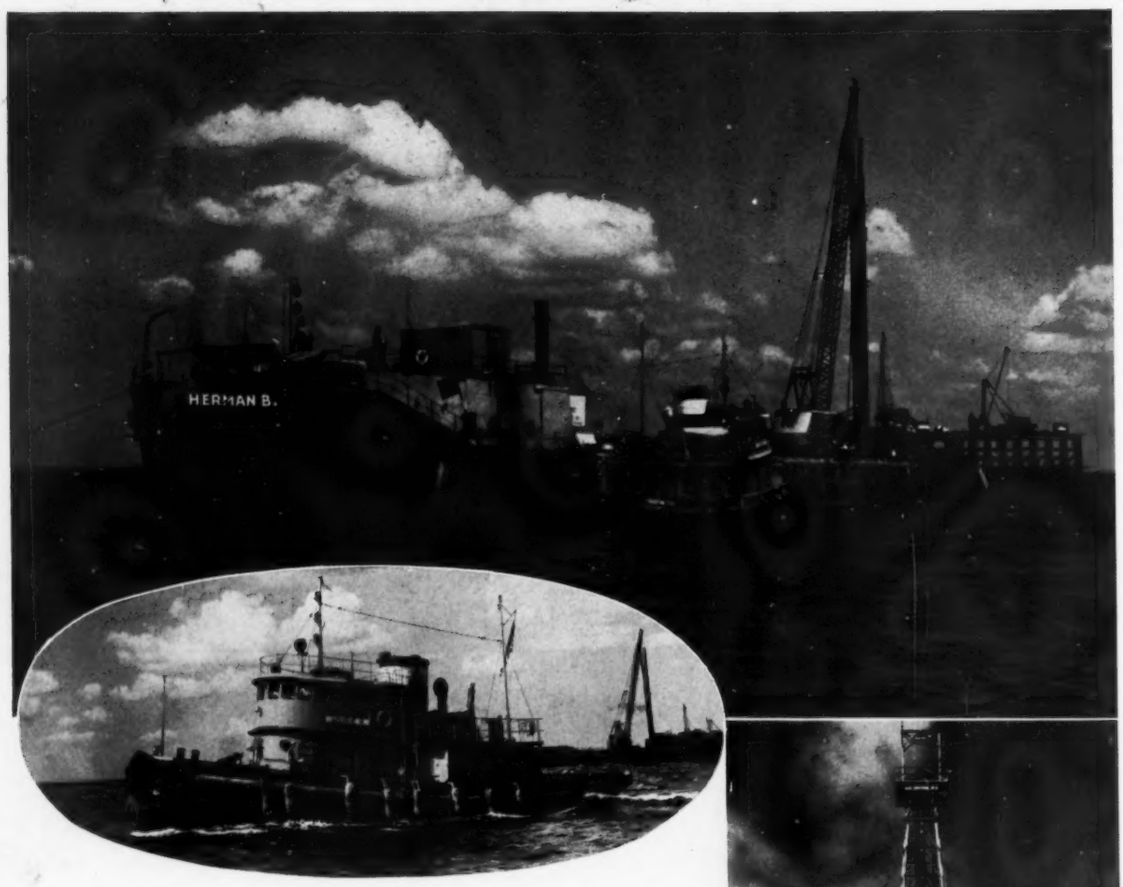

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WORLD PETROLEUM

Founded by Russell Palmer

PUBLISHED BY MONA PALMER

THE MANAGEMENT PUBLICATION OF THE INTERNATIONAL PETROLEUM INDUSTRY

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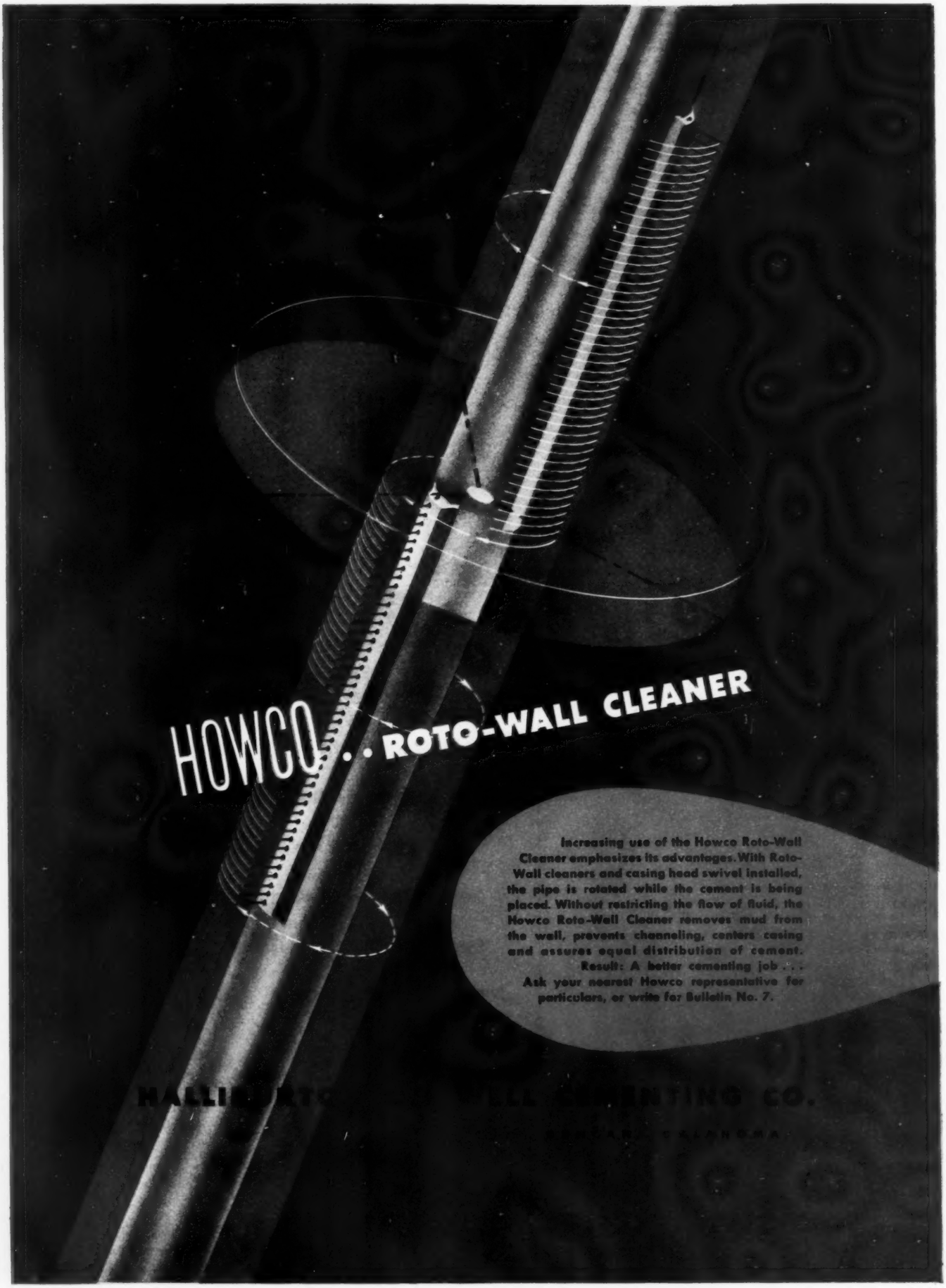
THIS MONTH'S COVER. Foster Wheeler rerun unit at the Llandarcy refinery of National Oil Refineries, Ltd. (Anglo-Iranian) at Llandarcy, Wales. This plant has been enlarged to 10,700 barrels daily from its prewar capacity of 7,000 barrels and plans now are being made for a further increase to 20,000 barrels a day.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EDITORIAL

FUEL SITUATION TESTS OIL INDUSTRY

SELDOM if ever before has the oil industry been forced to deal with a situation as difficult as that which has imposed itself during the current winter season in the provision of distillate fuels. It cannot be charged that the threat of impending shortage in the supply of these products came without warning or that it was ignored by refiners, who have made valiant efforts to increase the output of these products and have long been urging restraint upon consumers in their use and in the installation of oil-burning equipment. The same factors that have hampered oil men in their endeavor to keep pace with swiftly-rising demand for all their products have borne with particular effect upon heating oils because the consumption of this class of products has increased more rapidly than any other group.

In the United States, where the greatest volume of light and middle distillates find their market, the consumption of distillate fuel in 1947 was more than twice as great as it had been just before the late war. This compares with a gain of 45 percent in gasoline. Following the peak of wartime demand in 1945, there was an increase in the consumption of light fuel in the next year, although a small decline took place in gasoline and residual fuel. And in 1947 there was a jump of 18 percent in total domestic and export demand over 1946.

This astonishing rise stemmed in large part from the installation of more than a million oil-burning units in American homes between the close of the war and the commencement of the season of heavy fuel consumption in 1947. These alone would account for an addition of nearly 50 million barrels to yearly demand aside from the growth in other forms of use.

In November, regarded in the trade as marking the start of the season of heavy consumption, distillate stocks were at approximately the same level as on the corresponding date a year earlier. From that point they began to fall rapidly, and during December withdrawals reached roundly a half million barrels daily according to official reports. Alarmed by this unusual shrinkage and by the possibility that supplies might fall below the minimum of 35 million barrels considered essential as working stocks, renewed efforts were exerted to increase production and at the same time to induce consumers to save oil in operating their heating plants. Trains of tank cars loaded with crude and fuel oil were rushed from the Gulf Coast to the East regardless of added expense. Refinery runs were stepped up and the ratio of fuel oil production increased. In the first week of 1948 the output of middle distillate set a new mark 40 percent above the corresponding period in the preceding year. Beyond this there is little that refiners themselves can do to avoid a threatened shortage.

Unfortunately weather conditions in the greater part of the country have added to the strain on supplies. Repeated heavy storms, zero temperatures throughout the northern states and unseasonal cold extending southward to the Gulf have increased fuel requirements and at times have interfered seriously with deliveries. With normal weather during the late winter months and a continuation of the conservation measures already set up, it should be possible to get through the remainder of the winter without serious inconvenience, but a recurrence of extreme cold and heavy storms may involve added difficulties.

One heartening feature of the unpleasant squeeze in fuel oil supplies has been the manner in which the oil industry, the consumers and public officials have cooperated to mitigate local shortages and to insure an equitable distribution of available supplies. With an appreciation of the importance of informing the public which it has not alweays displayed, the oil industry is conducting a publicity campaign to explain the causes of the present situation and the need for wide public participation in the conservation of fuel. Individual companies have devoted advertising space and radio time to the same end, urging the users of fuel oil to avoid overheating their homes, to turn down thermostats at night and in every possible way to stop unnecessary waste. How widely their recommendations are observed it is impossible to say, but a great many citizens have reported that they are following the suggestions.

In nearly all the eastern and central states fuel coordinators or committees have been appointed to work with oil distributors in allocating supplies and establishing pools to be drawn upon in emergency cases. Under the so-called anti-inflation law adopted by Congress only last December such cooperation, formerly forbidden, is now legalized. In many states local commitments have been set up in cities and towns. Acting under the same law the director of the Oil and Gas Division of the Interior Department requested the National Petroleum Council to prepare a report for similar action on a national scale. Through this intelligent course of action the situation is being handled with a minimum of discomfort and with a maximum avoidance of ill will.

INTERNATIONAL PETROLEUM EXPOSITION OF 1948

STARTING in 1923 with the ambitious title of International Oil Exposition and Congress, but with only a handful of exhibitors and a few thousand visitors, the Tulsa oil show has grown in pace with the development of the petroleum industry itself. Each biennial gathering attracted more numerous and more elaborate displays and a larger and more representative attendance. As the Exposition grew in size, its reputation spread and it acquired more and more of an international flavor as men from every oil-producing country were drawn to it by the educational value of seeing assembled in one spot the latest developments in oil industry equipment and methods of operation. By 1938 the attendance had risen to more than 200,000, and the Exposition had gained the distinction of being the largest in the world devoted to a single industry.

With the outbreak of World War II the entire resources of the oil industry were directed to the support of military operations, and it became necessary to suspend the exhibitions. The last show of the prewar period was held in 1940 and was marked by 628 displays, the greatest number that had been shown up to that time.

Following the close of the war the Exposition company, which by the way is a non-profit organization officered by prominent oil men, began preparations for the resumption of the show. It soon became evident that interest in the affair, both on the part of companies planning exhibits and of prospective visitors, was so widespread that greater space and increased facilities were needed. In order to provide time for these changes, the resumption of the exposition was moved forward from 1947 as first proposed to the present year, and the exposition will be held from May 15 to May 22 inclusive at Tulsa, Oklahoma, U.S.A. This date is the more appropriate since it follows by twenty-five years the first modest show and makes this the Exposition's silver anniversary.

Now, after two years of industrious preparation on the part of its management, the Exposition will soon be ready to open its gates to a new and greatly enlarged version of the world's fair of the oil industry. In the eight years since the last previous assemblage, the oil industry has increased vastly in size. Production has risen by 45 percent or more than a thousand million barrels annually, and the industry has been extended to new areas throughout the world. Not only that but great and in some respects revolutionary advances have been made in methods of oil search, recovery and processing and in the equipment which the industry has at its command.

To accommodate the demand for display space and the crowds of visitors who will attend the show, the management of the Exposition has enlarged the grounds by including a strip along one side which adds something over two acres to the available space. The Exposition's buildings have been redecorated and improved. A "white way" has been established and a mile of new pavement has been laid. Companies that have permanent holdings in the exposition grounds are enlarging their buildings or erecting new ones at an investment of several hundred thousand dollars. Capacity of the cafeteria devoted to the feeding and refreshment of visitors has been doubled, and booths for the use

Aerial view of Exposition grounds at the last prewar show.

William B. Way, general manager of the Exposition.

Oil show and Nomad officials confer. Left to right: H. R. Powers, exposition secretary; Charles W. Thornhill, chairman, national board of regents of the Nomads; W. G. Skelly, exposition president; Clyde H. Pape, treasurer; and Frank J. Hinderliter, vice president.

of exhibitors have been installed in sections of the grounds not previously devoted to display purposes. Even with these additions, the facilities provided have not been sufficient to satisfy all requests. With allotments made to upward of 800 exhibitors, the Exposition still has some 200 applications that it has not been able to satisfy.

Other additions to the Exposition's equipment include a four room hospital and a special building for the reception and entertainment of visitors from abroad, which will be staffed and operated by members of Nomads, well-known organization composed of representatives of manufacturers of oil industry equipment who travel outside the United States in the promotion of export sales. The Nomads will play a conspicuous part in the Exposition. The number of visitors from outside countries is certain to be far larger than ever before. Several nations have announced their intention of sending official delegations numbering in certain cases as many as thirty or forty. Companies engaged in oil operations in various parts of the world will send members of their technical staffs to familiarize themselves with the latest advances in methods and equipment, while the number of individual applications from abroad for room reservations outruns all previous records. From advance reports it is evident that hundreds, perhaps a thousand or more, visitors from other parts of the world will be present in Tulsa next May. Owing to their wide acquaintance in other lands and their familiarity with the languages and customs of foreign visitors, the Nomads are peculiarly qualified to act as the hosts and advisers of such visitors, and this is the function for which they have volunteered. The Tulsa chapter of the organization will head up this particular activity, while other chapters in New York, Los Angeles, Houston and Dallas will participate in the work and will have members present in Tulsa during the show. The New York chapter of Nomads has issued an invitation to visitors who may journey to the Exposition by way of New York to telephone the Nomads' representative on their arrival in the city for any information or guidance they may need. Chapters in other cities have made similar arrangements for those who may arrive at southern or western ports.

In the Nomads building, just inside the main entrance to the Exposition grounds, a committee of members will be on hand at all times to welcome visitors from abroad, to guide them in seeing exhibits in which they may be particularly interested, to aid them in finding suitable quarters or in arranging trips to oil fields or refineries which they may be interested in visiting. Several field trips to nearby points have been arranged for their convenience during or following the show. At the headquarters building visitors will have at their command the services of translators and of stenographers capable of taking dictation in various languages. Several floors in one of Tulsa's leading hotels have been set aside for the use of foreign delegations. Reservations for individual visitors are made on application to the special bureau established by the management of the Exposition. As all available space has been reserved, applications direct to hotels will not be considered.

Numerous functions for the entertainment of visitors from abroad have been arranged. These will include a special dinner in their honor, the field trips previously mentioned and numerous other affairs that are being arranged. For their collective or individual assistance, they will have at hand at all times the services of friendly Nomads.

One of the serious problems in connection with the Exposition was that of finding living quarters for the great influx of participants and visitors. With the probability that a quarter million or more persons will attend the show during its eight-day continuance, the task of caring for them is far beyond the capacity of the city's hotels. To meet the situation, a housing bureau was established several months ago in the Wright Building, Tulsa, manned by a special committee appointed for this purpose. All hotel space in Tulsa and nearby cities, all tourist courts, vacant rooms and apartments were placed at the disposal of the committee for assignment to applicants on an equitable basis. An appeal was made to householders who were in a position to do so to vacate their homes during the week of the show and to make them available to visitors. By these means the amount of space normally available has been multiplied to an extent that it is believed that all of those who send in advance applications will be provided for. Several oil and equipment companies have leased private homes for the accommodation of their representatives and guests. Others are chartering private cars which will be used as living quarters, and still others will press into service planes that will make daily trips to Oklahoma City or other towns within convenient reach.

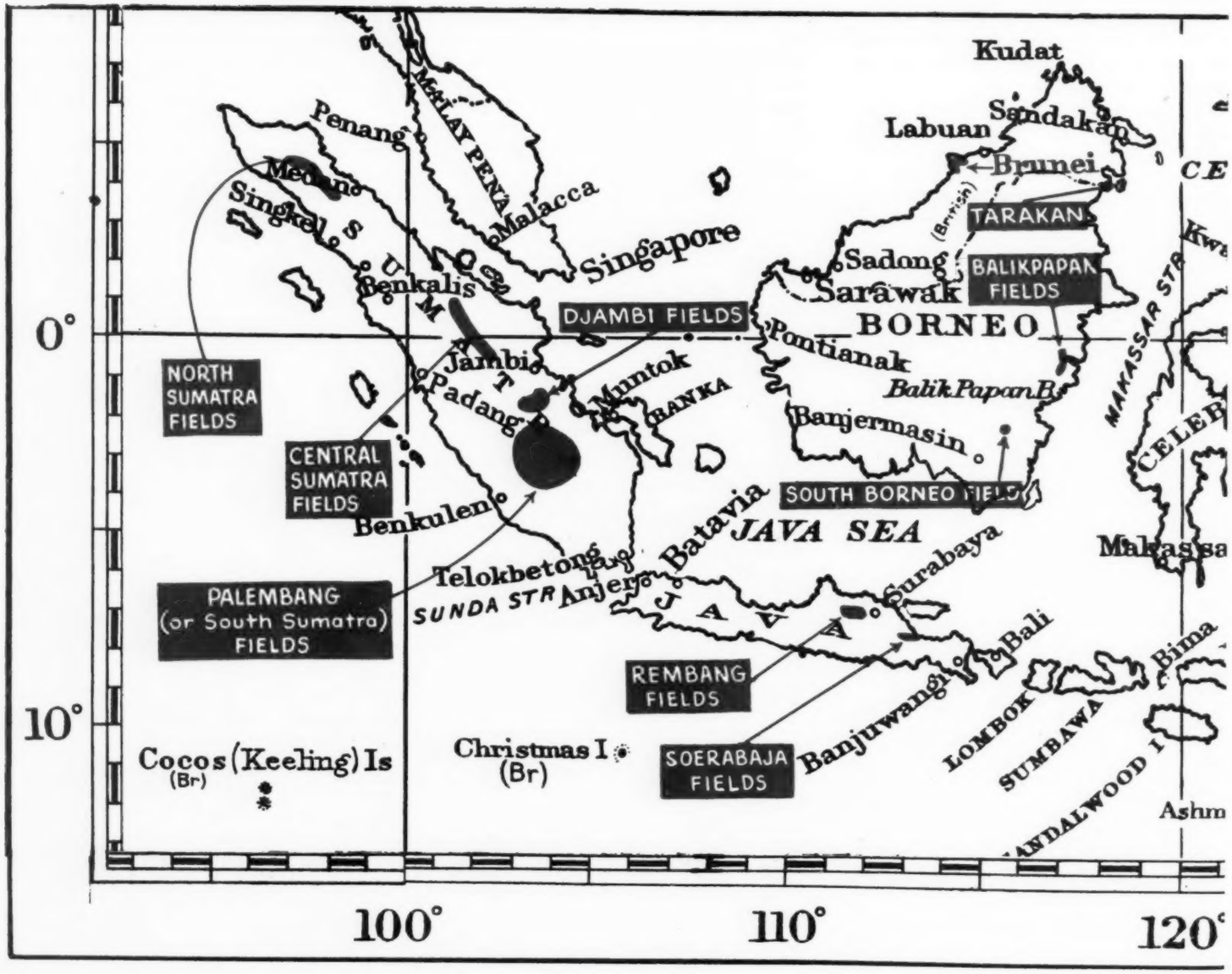
A feature of the Exposition to which special attention will be given is the Hall of Science, a roomy building adjoining the exposition grounds which will house exhibits illustrating the technical progress of the industry and where lectures relating to this phase of petroleum progress will be given. This part of the show is under the direction of the Scientific and Technical Committee of the Exposition, of which Dr. B. B. Weatherby of the Amerada Petroleum Company is chairman. This committee is also giving consideration to possible arrangements for holding the next World Petroleum Congress, due to take place in 1950, at Tulsa in connection with the next Exposition. Representatives of the Congress have expressed a desire to hold its next session in America. The first Congress was held in London in 1933, and the second in Paris in 1937 in connection with the Paris Exposition of that year. The third meeting was scheduled for Berlin in 1940 but was prevented by the war. The question of holding the next session in Tulsa is expected to come up for discussion during the Exposition in May.

GOOD PROGRESS BEING MADE IN FAR EAST RECONSTRUCTION

CRUDE oil production in Oceania and East Asia today is only half as large as in 1939, and the average for 1948 probably will not exceed 75 percent of prewar. On the other hand most of the markets customarily served by Far Eastern production are just as hungry for petroleum products as other parts of the globe, and current consumption is about 35 percent higher than in 1939.

Before the war the Orient required a net importation of about 100,000 barrels daily of petroleum products. Offshore shipments from California had been large for a generation, and in the early days of the industry kerosene and oil from Pennsylvania competed with Russian oil for the Far Eastern markets. Today the United States cannot be looked to by the Orient for substantial shipments. It must be supplied by the Middle East and from its own resources. In the present state of the industry it is estimated that the deficiency in local production will be about 275,000 barrels daily in 1948.

To fill this gap the petroleum industry is working at top speed to rehabilitate its properties in Indonesia which supplied 80 percent of the



oil produced in the Far East before the war. Of the remainder 12 percent came from India and Burma and eight percent from Japan and Sakhalin.

Cost of the rehabilitation work in the Indies is so great that even the largest companies are finding it necessary to raise special sums in the new capital market. The Royal Dutch-Shell group of companies recently determined that it would need $100,000,000 before the end of 1949 in order to defray capital costs of the N. V. de Bataafsche Petroleum Mij., the operating company which is charged with producing and refining in the Indies. Since the end of the war the Standard-Vacuum organization has spent about $45,000,000 in its oil operations in the N.E.I. area, mostly for rehabilitation of war damaged installations. Current plans call for the expenditure in 1948 and 1949 of another $75,000,000 in this same area.

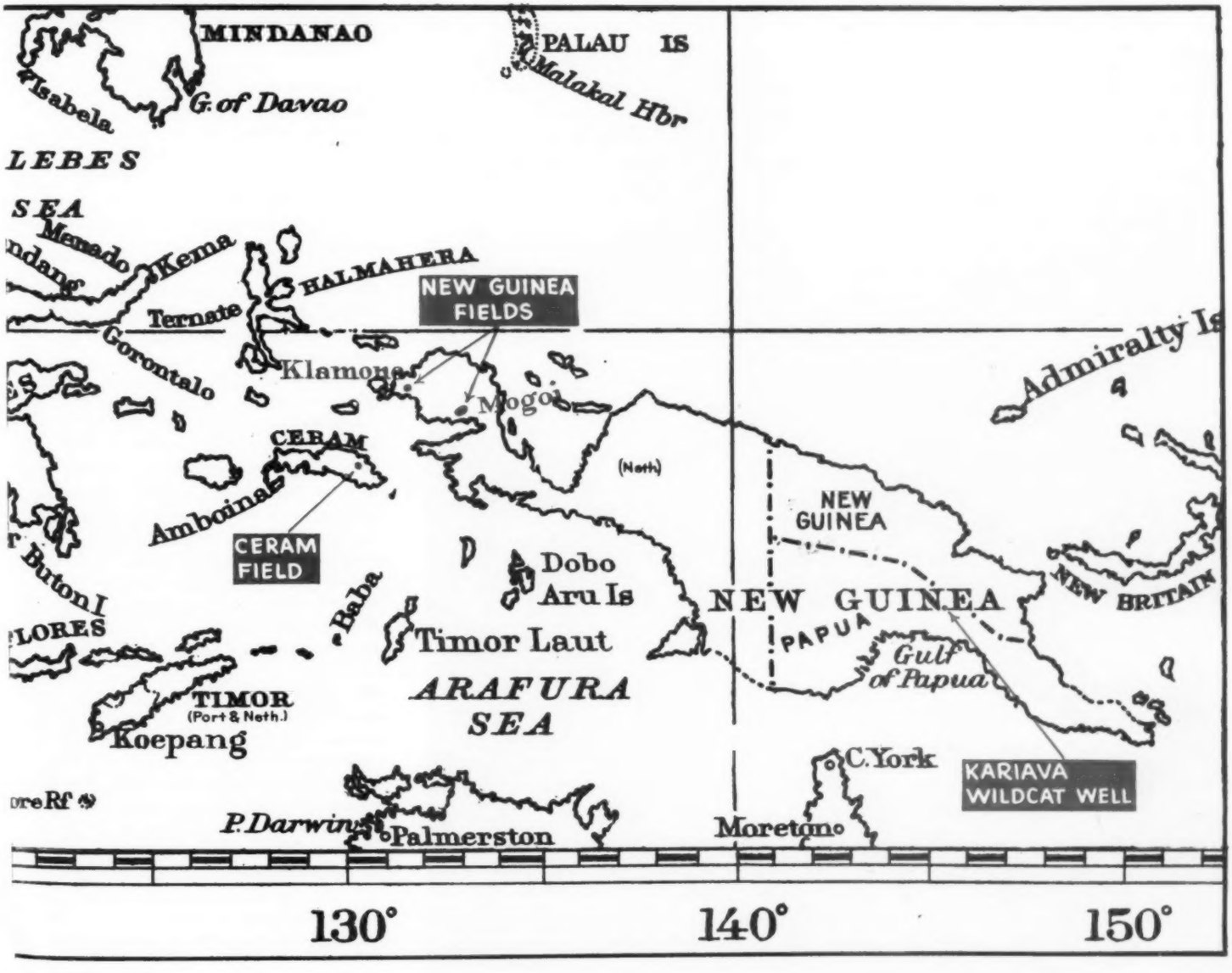
Restoration activities are centering in Borneo and Sumatra, and the development of entirely new sources of oil is centering in New Guinea. No work has been attempted as yet in Ceram, but this is not surprising because the prewar output of wells on that island averaged only about 2,000 barrels daily. Unsettled political conditions in Java have restricted development there to a small area at Krukah where 38 wells have been restored to production and are yielding about 1,000 barrels of crude daily. Before the war Java produced about 17,000 barrels of crude daily.

As far as land area is concerned, a large majority of Sumatra still is occupied by insurgents, but the rich producing fields of South Sumatra are in the hands of their prewar operators, and there is no political strife except for occasional sniping by revolutionists on the sparsely populated perimeter. Production is being brought back as rapidly as possible. Current output is about 65,000 barrels daily compared with 115,000 barrels for all of Sumatra in 1939.

Both British and Dutch Borneo were reoccupied much earlier than other parts of Indonesia at the close of the war, and rehabilitation was begun in some fields even before VJ Day. Production in British Borneo is now 48,000 barrels daily or nearly three times the prewar rate. In Dutch Borneo both refinery and field installations were badly damaged at the end of the war, but wells are being redrilled and production is averaging about 13,000 barrels daily compared with about 36,000 barrels daily prewar.

Before the war the Nederlandsche Nieuw Guinee Petroleum Maatschappij (NNGPM) began exploratory work on a very large concession in Netherlands New Guinea. This company is owned 40 percent by the Royal Dutch Shell interests through the Bataafsche Petroleum Maatschappij (BPM), 40 percent by Standard Oil Co. (N.J.) and Socony-Vacuum Oil Co. through Standard Vacuum Oil Co. and 20 percent by The Texas Co. and Standard of California through Nederlandsche Pacific Petroleum Maatschappij (NPPM). BPM is the operator for its partners. The original concession covered 23,000,000 acres, but this has now been reduced to 20,000,000 acres.

Three fields had been discovered before the war. Of these Klamono received the most attention, probably because it was somewhat more accessible than the others, being adjacent to the



The first party to survey the Pendopo field area, following Japanese surrender. Shown on the Lematang River landing approaching Pendopo, are three Standard-Vacuum representatives, left to right, A. J. Gotz, prewar production supervisor at Pendopo and now assistant production superintendent; J. A. Van Dyke, an engineer; and Lieutenant E. E. Muhs, U.S.N.R., a marketing engineer.

Klasafet River which is navigable by small craft. Klamono is a dome of small extent in the eastern part of Netherlands New Guinea on which 14 wells were drilled before the war. Of these eight were productive from the miocene lime topped at about 650 feet. No storage or transportation facilities have been provided for the oil, so the field still is shut in but a 45 kilometer road is being built from Sorong. The oil is asphaltic, of 20 gravity with little gasoline content.

Two other fields discovered, both in eastern New Guinea, are known as Wasian and Mogoi. They are about 125 miles east of Klamono. Production was found at Wasian at 3,300 feet and in Mogoi at 1,300 feet, in the top of the miocene lime. The oil is a 40 gravity waxy crude of high gasoline content. More drilling is needed in these as well as in other New Guinea fields to determine their potentialities, but the operators are optimistic. Access to these fields is along the Temboeni River which is very difficult to navigate. A 45-kilometer road through the jungle is being built from the Wasion and Mogoi area to tidewater, so that equipment may be moved in for development. All operations in New Guinea as well as in other parts of Indonesia are made difficult by lack of transportation, dense jungle and tremendous rainfall.

At present there are about 280 supervisory employees and 4,400 laborers and field personnel engaged in the New Guinea campaign. Operations formerly located at Morotai are being moved to Sorong. Very great sums are being spent for geological and geophysical surveys and for camp and road building as well as for actual drilling work, as is always necessary in the development of new areas in the tropics. No plans have been made as yet to build a refinery because of the preliminary nature of the work thus far done.

There is a large geologically favorable area to be explored for oil in New Guinea, and some geologists are of the opinion that it may become quite important as an oil producer.

The New Guinea campaign is the only major exploratory work now under way in Indonesia.

"However, in Papua extensive exploration which was begun before the war has been resumed by Australasia Petroleum Company (Standard Vacuum 40%, Anglo-Iranian 40%, and Oil Search Ltd. 20%). A wildcat well is being drilled at Kariava, with the present depth about 11,000 feet."

The principal job at hand is the rehabilitation of war-damaged properties, and this work is providing employment for more persons than were used by the oil industry in its normal operation before the war. A recent survey by the Netherlands government showed current oil industry employment at 33,490 compared with 33,008 in 1939.

Oil production in Sumatra dates backs to the drilling of a gusher at Langkat in North Sumatra in 1885 in an area where seepages had been observed.

The first refinery in Sumatra was built at Panghalan Brandan on the Babalan River in 1891. A second was installed in 1897. The early wells were gushers at shallow depths, some as little as 245 to 500 feet. But the coarse-grained, loose sands and marly shales of the upper tertiary soon gave up their oil, and deeper drilling was necessary. Wildcats were drilled over a belt some 10 miles wide and 70-odd miles long on the northeastern coast along the Straits of Malaka. Some deep wells—for that period—were drilled to 1,200 feet.

All of the oil Sumatra has been found on the eastern side of the central mountain range. To the west the structure drops off sharply to the sea, but to the east there is a series of long parallel folds which have proven productive in the Tertiary, largely in Miocene, although there has been some oil in the Upper Pliocene. Producing horizons often have great oil saturation.

Oil development, in South Sumatra, which is the only area now open to production because

A prewar SVPM repressure plant. Inset is a view of part of the compressors after the war.

of political conditions, is more recent than that in the north, although some oil was being produced and refined by the Dutch Company, Moeara Enin, and sold to M. Samuel & Co., predecessor company of Shell. The Royal Dutch Co., another predecessor company later merged with Shell, was producing high-gasoline-content crude in south Sumatra at the turn of the century. Standard Vacuum (SVPM) did not begin development until 1912 when it obtained concessions in the Palembang residency. In the past 35 years SVPM has developed three fields in an area of some 100 square miles. The fields lie about 81 miles west and a little south of Palembang city. In the first eleven years SVPM drilled 105 wells and got only 13 producers. Results were so meager that the company was considering abandoning the entire N.E.I. project. Discovery of the Talang Akar in 1922 made the campaign a success.

Up to the time of the Japanese invasion SVPM had drilled 784 producing wells and 306 dry holes. Wells redrilled to deeper horizons totaled 119, bringing total drilling operations to 1,209. At the time of the invasion SVPM had 500 producing wells of which 85 percent were flowing and the remainder were operating on gas lift. No wells were being pumped. Production of the 500 wells was 45,000 barrels daily, about the same as the capacity of the pipelines to SVPM's refinery at Palembang.

The refinery was completed in 1926 at Soengei Gerong on the Koemering and Moesi rivers, with a capacity of 3,500 barrels daily. It was enlarged through the years and just before the war was equipped with aviation gasoline manufacturing facilities and capacity was raised to a little more than 45,000 barrels daily. SVPM demolition by Netherlands government military authorities was so effective that the aviation gasoline plant was never operated by the Japanese who were unable to run much more than 25,000 barrels of crude per day. Near the close of the war, Allied airmen partially destroyed what the Japanese had been able to restore so the current task of that company is not simple.

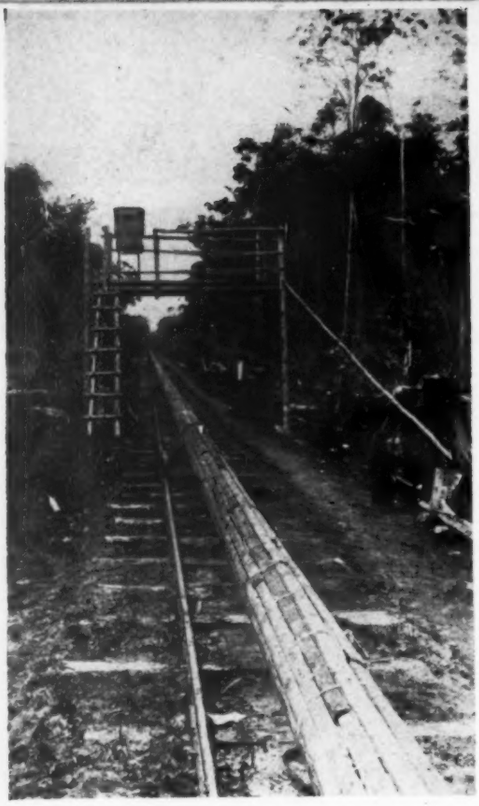
That 55 percent of all the producing wells drilled on the concession in a period of 30 years were flowing and 65 percent of all wells drilled were producing at the time of the invasion is an interesting sidelight on producing methods of SVPM. Much of the early development of efficient producing techniques was carried out in areas such as this because engineers had complete field control and were not forced to get the oil and get it quickly, as was the case in competitive fields in the United States. The term MER is one which was developed in areas such as Palembang where production engineers could prove out their theories of obtaining maximum recovery at lowest cost by utilizing reservoir energy. SVPM stripped casinghead gas of its gasoline content and reinjected the residue into the producing horizon in a manner similar to that being practiced in unitized fields in the United States today.

The most important field developed by SVPM

General view of Pendopo field in South Sumatra.

Tarakan field in Netherlands Borneo, one of the most prolific of NEI fields.

Below: Field workers houses in Sumatra before the war. Bottom: clubhouse for SVPM employes at Pendopo.



Pipeline with protecting covering being moved in by rail in long sections in Borneo.

before the war was Talang Akar-Pendopo where 24,000 barrels daily of 36 gravity crude was being produced from 264 wells at a depth of 2,800 feet before the invasion. Production was from the basal portion of the Tertiary. Like the oil from other fields, the wax content was so high that careful handling was necessary to keep it moving through the line to the Palembang refinery.

Other south Sumatra fields developed by SVPM were Djivak with 115 wells producing 6,600 barrels daily from a depth of 1,000 feet; Benakat with 140 wells producing 10,000 barrels daily from 1,500 feet; and Redja, a new discovery at 7,000 feet on an exploration concession which had not been converted to an exploitation concession at the time of the war.

When the Japanese invaders came to Sumatra, Dutch military were able to destroy the refinery effectively, but only part of the wells in the four fields could be completely junked. As a result the Japanese were able to restore production in substantial quantities. Best estimates are that enemy production from SVPM fields in four years of operation totaled 28 million barrels. In 1943 a peak production of 12,284,000 barrels was reached, equal to about 75 percent of SVPM prewar production. In the entire East Indies including British Borneo, the Japanese are believed to have produced 61,579 barrels daily in 1942; 127,884 barrels daily in 1943; 75,468 barrels daily in 1944, and 16,699 barrels daily in 1945 before VJ Day. These figures were gathered by government authorities from a commission of more than 100 Japanese who were engaged in the oil industry in the East Indies during the war. Official Japanese records had been destroyed, so most of the figures gathered were from private notes of individuals or from memory. It is known that Japan drew almost all the oil it used to fight the war from the East Indies, and best estimates are that the total from this source was some 102,840,015 barrels which was, of course, only a drop in the bucket compared with Allied military oil consumption. Before the close of the war the Japanese were frantically trying to make gasoline from organic materials from forest and farm.

Due to unsettled political conditions, it was not possible for SVPM to undertake rebuilding its Palembang refinery until September, 1946, and the field work was not begun until nearly a year later. Production was resumed in October, 1947. Only incident to disturb the reopening of the fields was the firing of several wells by extremists. These fires were put out with the aid of experts from the United States who were flown in for the job.

SVPM engineers expect to find the producing ability of wells in the three fields only slightly below prewar when mechanical conditions are checked. The Japanese partially operated the compressor plants but had not sabotaged the wells themselves. At present some 100 wells have been restored to satisfactory mechanical condition, and work-over crews are going over the field as rapidly as possible. Present production is 20,000 barrels daily, and the SVPM timetable contemplates a production of 35,000 barrels daily by April and a prewar level of 45,000 barrels daily by fall.

Before the war SVPM had some 11,000 employees in South Sumatra. Many of these stayed on in company houses and lived off the land as best they could during the war. The company housing facilities have gone down hill very badly during the long period of no repair or painting. Many structures were found to have been camouflaged from Allied airmen by covering with tar and sprinkling with earth. It can be imagined what a mess such buildings were in when SVPM came back. The company now has about 7,000 local employees on the job, of whom about 60 percent are prewar employees who stayed near the properties or wandered back as soon as they learned that operations were being resumed. About 250 Dutch and American supervisors and technicians are employed.

SVPM has been importing large quantities of food and clothing to help restore its employees to normal standards of living. Before the war the oil industry was highly regarded by the Indonesians for the excellent pay and working conditions which it offered. As described in the November, 1947, issue of WORLD PETROLEUM, the Indonesian employees carried out elaborate religious ceremonies when the wells, pipeline and refinery were being reopened.

In addition to the work-over crews, SVPM has begun drilling of new development wells in a small way. Later in the year it is planned to run eight or ten rigs.

As political conditions improve, SVPM hopes to resume its prewar exploration of concessions in the wide swampy plains of east central Sumatra which are not now accessible. An area some 500 miles long and extending far in from the sea is considered favorable for oil accumulations, but most unfavorable for oil development. The terrain is quite similar to the swamps of South Louisiana. Little surface geology is possible, and the seismograph, torsion balance and gravity meter must be relied on. As a matter of fact, after 63 years of oil development in Sumatra, most of the more accessible and readily recognizable structures have been drilled. A great deal of the late exploration has centered on the search for stratigraphic traps as is the case also in the United States.

Shell interests have their reconstruction work well in hand at Tarakan in Borneo. Daily production is now up to 5,056 barrels daily which is being used as fuel oil after dehydration. Old wells have been put back on production and new wells are being drilled in both the Pamoesian and Djoeata fields. Reconstruction of roads, pipelines, tanks, shops and houses is progressing well at the port of Lingkas.

At Balikpapan some wells have been repaired and put back on production, but others have had to await arrival of equipment. The pipeline from Sanga-Sanga (Louise Anggana) via Sambodja to Balikpapan has been repaired.

A small refinery has been contrived at Balikpapan out of salvaged materials from the old plants which were destroyed during the war. The plant is producing kerosene, gas oil, fuel oil, diesel oil and waxy residue from 7,500 barrels of crude daily. Extensive preparations are being made to rebuild the former refinery on a much larger scale than before the war.

It was in the Balikpapan area of Borneo that Shell got its early start in the oil industry. As long ago as 1896 Marcus Samuel, the first Viscount Bearsted who founded the Shell Transport & Trading Co., Ltd., purchased the concessions held in Borneo by J. H. Menten in order to have a nearby supply of oil for the Far Eastern customers of Marcus Samuel & Co. A general trading business between Britain and the Far East had been conducted by the company for many years prior to that date. The company did a large business in shells in the early Victorian era. Highly polished shells were prized by Britons for the decoration of screens and boxes, and quite large shells were placed on tables and corner whatnots. It was from this minor item of the company's business that the name "Shell" was taken as a trade insignia which is now known in every part of the world. In the early days of the company, it dealt in cloth and all sorts of manufactured articles exported from Britain. On the return voyages the company's ships carried tea, jute, rice and materials for British factories.

In looking around for more business in 1890, Marcus Samuel began to consider selling kerosene. At that time Standard Oil was well entrenched in Eastern markets, and Nobel Brothers

Shell employee housing at Tarakan, Borneo.

One of the oil fires in South Sumatra which SVPM found when it regained possession of its producing properties.

of Sweden were selling Russian kerosene in cased quantities, although the same firm already was using tankers on the Caspian Sea. Mr. Samuel decided that the best way to get a foothold in competition with Nobel and Standard was to reduce transportation costs. He began this first by building the 4200-ton tanker Murex and moving bulk kerosene through the Suez Canal to bulk storage at strategic eastern ports. His second step was to obtain the oil concessions at Balikpapan to obtain fuel oil for the growing tanker fleet and for sale to the British Navy. The Balikpapan venture was successful from the outset, and it soon became necessary to build a refinery there, the forerunner of today's plant. Within a year after obtaining the concession, the oil business had grown to such an extent that the separate Shell Transport & Trading Co. was formed.

By 1898 Shell had completed a supply contract with Royal Dutch in Sumatra and thus laid the groundwork for the merger which later created the Royal Dutch Shell. In 1901 Shell contracted with the J. M. Guffey Petroleum Co. for Texas oil and became the first oil company with world-wide sources of supply although not the first with a world selling organization. Shell, as such, rounded out its first fifty years in 1947 and starts the second half century as one of the greatest commercial organizations of all time.

Royal Dutch Shell reoccupied a number of fields in south Sumatra in July, 1947. These included Talang, Djimar, Gocuoeng Kemala, Liman and Soeban Djirigi. Reconstruction was started at once. The Djimar field produced 7,000 barrels daily in August and was up to 10,300 barrels daily in September.

The pipeline to the Pladju refinery has been repaired and heating facilities for moving the paraffin crude made provisionally serviceable. The Pladju refinery was found by Shell to be very badly run down due to lack of maintenance work by the Japanese and due to Allied bombings. The plant has been reconditioned to the point where 31,450 barrels of crude is being refined daily. Plant production includes gasoline, kerosene, gas oil, diesel oil and fuel oil.

Shell has been unable to enter its main oil fields in Java: Kawengan, Nglobo and Sermanggi. The Lidah and Kroeka fields near Surabaya have been restored, although all installations at Lidah were removed by the Indonesians during their occupation of the area. In the Kroeka fields 70 old wells have been put back on production and three new wells drilled. Production is up to 1,170 barrels daily.

Two refineries are operating on Java. The Wonokromo plant, which was heavily damaged by Allied bombing in 1944, has been rebuilt and Shell is operating the smaller plant at Bendrel which the Japanese restored to operations during their occupancy. Combined capacity of the two plants is only 1,250 barrels daily, however.

The current production of the Seria field of Brunei, British Borneo, is at the rate of 48,000 barrels daily and has been attained after two and a half years of rehabilitation. This compares with the prewar production of 15,000 barrels daily. When the Australian forces recaptured the area in May, 1945, from the Japs, the oil fields and refinery were a complete shambles. In 1941 before its capture by the Japs, the British staff had systematically destroyed all means of production and refining, in accordance with plans drawn up in 1937 to cover such an eventuality. All flowing wells were plugged with cement and the rest rendered useless; the destruction being of such an order that the Japs never succeeded in getting back to the prewar production.

No more than half the refinery plant was put into operation by the Japanese and that only after a considerable time. They were handicapped by Allied aerial bombing in 1944-45, but in any case they made poor use of any opportunities they had of developing the oil resources during three and a half years of occupation. On being driven out by the Australians, they left a trail of destruction, having blown up the installations, stores and tanks and set fire to the wells. It took the combined efforts of the staff and a special fire-fighting squad brought over from America three and a half months to extinguish all the fires. New drilling plant has been obtained from America, and many new wells have been drilled as well as old ones reconditioned.

A complete new refinery has been purchased from the United States and erected, and a large portion of the old refinery repaired. Many miles of new piping have been laid in the fields and from the fields to refinery; in addition two new submarine loading lines three miles long have been launched into the sea.

The first oil shipments were made in 1946, the total amount in that year being 2,100,000 barrels. In 1947 the refinery at Lubong was put into operation and in that year 13 million barrels of crude oil and products were exported. The present rate of production of 48,000 barrels daily is to be increased still further, and British Borneo bids fair to becoming the biggest oil producing unit of the British Commonwealth in the not-so-distant future.

Before the war NPPM (Cal-Tex) had done some exploration work on a large concession at Rokan in north central Sumatra, but this area also is not yet open for work. Actual production on the island was divided between Shell and SVPM, with Shell producing about 70,000 barrels daily and SVPM 45,000 barrels. By the end of 1948 Shell plans to have a production of about 65,000 barrels daily from the Pladju fields in south Sumatra alone, and, as previously mentioned, SVPM expects to be up to 45,000 barrels, thus bringing the island's output within shouting distance of its prewar peak of about 115,000 barrels daily.

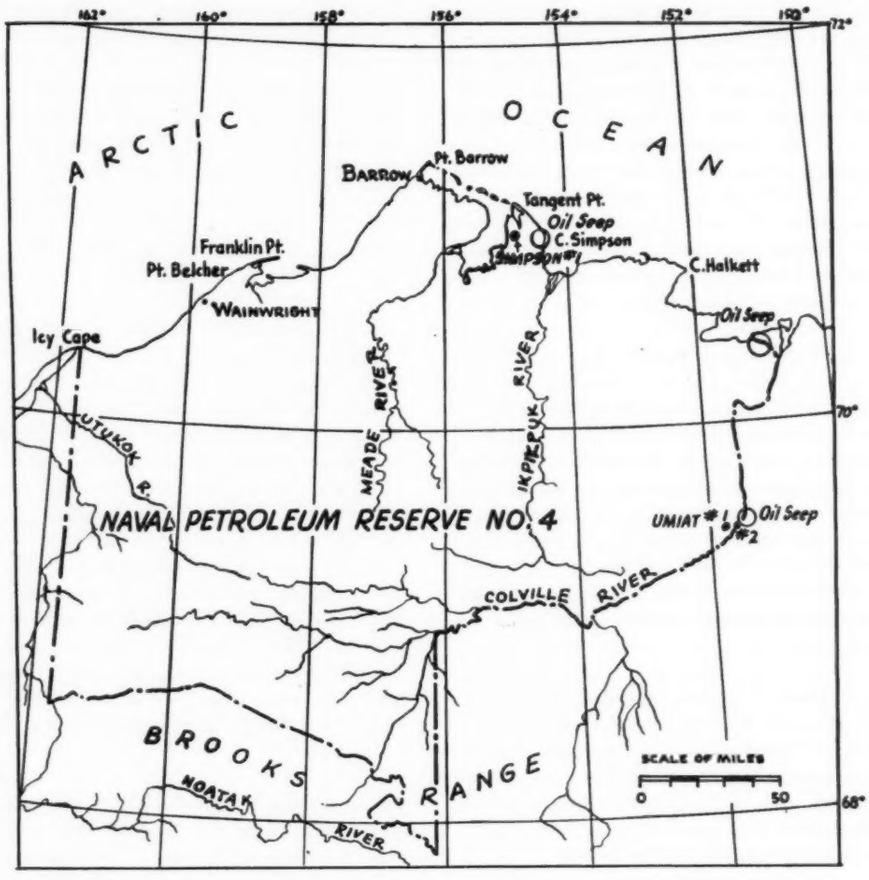
Such a production level with the restoration of adequate refinery capacity by Shell at Pladju and by SVPM at Palembang and the large increases already achieved in British Borneo will do much to close the gap between supply and demand in the Far East and permit Middle East crude to flow more in the direction of Europe. Perhaps most important of all, the rehabilitation of the East Indies and the possible development of substantial production in New Guinea will shorten supply lines for oil products and relieve the transportation shortage which is so acute today.

ALASKAN EXPLORATION MAKES STEADY PROGRESS

Supplies arriving by sea at Point Barrow must be brought from ship anchorage to shore by barge in the brief season when shipping is possible.

WHILE the search for oil is being carried to many remote corners of the world, it is safe to say that none of these efforts is being conducted under more difficult conditions than the exploratory work that is under way near the extreme northern tip of Alaska. Here, well within the Arctic Circle, lies an area of roundly 35,000 square miles officially known as United States Naval Reserve No. 4, parts of which are being subjected to scientific methods of survey and exploration in an endeavor to determine whether the liquid fuel resources concealed beneath the barren surface of the region are sufficiently extensive to justify development.

From time to time one or more of the men engaged in this "Operation Arctic" or some visitor who has spent a few weeks in the field as a guest of the Navy, returns to the States with information as to the progress of developments in this northern outpost of the western hemisphere. Because of its very remoteness and perhaps because it is a government project, those connected with it are little inclined to indulge in speculation as to its potentialities. Yet it is possible to detect in conversation with those who have been closely associated with the undertaking a quiet confidence that in time to come these barren Alaskan wastes will become an important source of petroleum supply to the United States.



Naval Reserve 4 was established in 1923 by order of President Harding on the basis of the existence of numerous seepages within the area. It lies between the Arctic Ocean and the Brooks Range, extending from Icy Cape on the west to the Colville River on the east. For more than twenty years no effort was made to explore the district, but when war came to Alaska and the need for oil in the Pacific area became urgent, the Navy in 1944 sent in a battalion of Sea Bees who established a beachhead, camp, airfield and radio station and began exploratory work. During their occupation the first test well was spudded in on the Umiat structure in the southeastern part of the area on June 23, 1945. This preliminary work was paid for by Navy funds and was carried on under the direction of Admiral Ben Morrell, Captain Bart W. Gillespie and other officers with the assistance of experienced geologists, geophysicists and other petroleum experts. Following the capitulation of Japan, the Sea Bees were withdrawn in September, 1945, when the first well had reached a depth of 1816 feet, and the work was temporarily suspended. On the strength of the favorable structures that had been located, Congress at its following session was induced to make an appropriation of $9,600,000 to continue the exploration until June 30, 1950. Under this appropriation the work has been carried forward during the past two seasons.

Ted Matthews, civilian in charge of the Navy project at the base camp, Point Barrow.

Sled trains pulled by "Cat" tractors are useful for overland hauling most of the year.

While the undertaking is still a Navy enterprise and is still under the supervision of Commodore Greenman and the immediate direction of Captain Gillespie, now a civilian, the Navy has avoided the mistake of attempting to carry on operations with its own forces but has contracted the services of a well-known geophysical organization for its surveys and experienced contractors for drilling operations. Even the transportation of equipment and supplies is in the hands of the bush fliers of Alaska who are thoroughly familiar with its terrain and weather conditions.

Conditions governing exploratory work in this Arctic region are radically different from those encountered in less frigid zones. The season of open navigation permitting the landing of heavy equipment at Pt. Barrow is limited to a few weeks in midsummer. On the other hand the movement of this equipment to drilling sites can take place only when the ground and watercourses are frozen to a depth of four feet or more that will sustain the heavy loads. Consequently it is necessary to select drilling locations one season and to move in the needed equipment during the ensuing winter for use during the following season. Careful advance planning is essential, and progress necessarily is somewhat tedious. The northern part of the Reserve is a broad coastal plain of low relief covered by tundra with numerous shallow lakes extending inland from the ocean to beyond the seventieth parallel and many rivers and small streams flowing northward toward the Arctic. When the thaws set in, much of this area becomes a morass difficult to traverse by any form of surface transportation. South of the lake region the surface rises in low rolling hills which become higher as the Brooks Range is approached. Rock exposures are poor even along the channels of the streams, and surface geology is difficult.

Out of the experience already gained, however, the operators in NPR-4 have devised means of overcoming many of the obstacles. Except when heavy storms occur, winter weather does not prevent gravimetric surveys by planes equipped with skiis or seismograph shooting from rigs mounted on runners. Planes and cat tractors provide the motive power for moving men and supplies from bases to field locations. Radio maintains constant communication with field parties and minimizes the danger of isolation by storms.

Bases for Alaskan operations are well equipped for all-year operations. The main base at Barrow and the sub-base at Umiat have dwellings constructed to meet Arctic conditions and to insure the comfort of workers at all seasons. Other structures are a power plant and office building. There is a recreation hall and motion picture theatre as means of entertainment. Warehouses are filled with machinery, spare parts and supplies of all kinds. Notwithstanding its remote location, the Arctic community maintains its contact with the outside world by means of the radio and regular plane service.

While much of the effort and expenditure involved in this Alaskan adventure necessarily has been absorbed by preparatory work, substantial progress has been made toward realization of its ultimate purpose. Geophysical surveys are well advanced and have located a few well-defined structures for future drilling. In addition to the first test well, Umiat No. 1, which was drilled to 6,005 feet, a second well, Umiat No. 2, was put down during the past summer and at last report had reached about an equal depth. A core hole drilled on the crest of the structure in the permafrost zone, which here extends to some 900 feet, is pumping 15 barrels per day from a shallow sand at 572 feet. A third test known as Cape Simpson No. 1, begun in 1947, had reached about 6,000 feet at the end of October and had encountered gas shows on the way down. This site is in the vicinity of the largest seepages on the reserve and embraces a small structure mapped by seismograph. A larger structure, defined by seismograph mapping during 1947, is located on Oumalik Creek, about 75 miles west of Umiat, and will probably be spudded within the next few months.

While the limited amount of drilling thus far undertaken has not led to production on a commercial scale, the tests and core holes which have been drilled have encountered several good oil shows leading to the belief that elsewhere in the Reserve formations more permeable and porous exist which should contain oil in commercial quantities. The experienced oil men engaged in the work are extremely optimistic that substantial production will be obtained in the area wherever structure and sediments lithologically suited for reservoirs are found together. Deeper drilling in the sedimentary layers of the northern portion of the Reserve is believed to have possibilities.

Up to this time about half the appropriation made by Congress has been expended or allotted. The total amount made available is, of course, small in comparison with the sums expended by private companies in exploring other areas of comparable extent which have presented fewer difficulties. The operating committee in charge of the work is being careful, however, to adjust operations to the appropriation provided and will be prepared to clean up their camps and pull out on June 30, 1950, if this becomes necessary. It is obvious that full exploration of the Reserve will not be possible within the time limit and the financial provision that has been set. Whether Congress will be disposed to extend the life of the undertaking may depend upon the results obtained in the next two years. If other promising structures are located and certainly if productive fields are discovered, it is reasonable to assume that authorization will be forthcoming.

No oil man who has visited Alaska believes that its petroleum possibilities are limited to the area included within Naval Reserve 4. East and south of the reserve are equal or larger areas that have the surface appearance of being petroliferous territory. Private prospecting in this part of Alaska is prohibited at present by an order issued during the late war. In any case private capital might be disposed to wait for the outcome of the exploration now being done under the Navy's direction before venturing into the region. If this current activity produces encouraging results, various oil companies will be likely to engage in Alaskan exploration if permitted to do so.

A by-product of the current operations that is regarded by the Army and Navy as having special importance is the information that is being collected regarding Arctic conditions. Studies of this subject that are being conducted from the Navy base at Point Barrow cover weather observations, coastal surveys, amphibious operations, insect control, clothing requirements, radio communication, construction and operation of equipment, road building, ground navigation, operation of ordnance, magnetic observations and geologic mapping. In view of the increased attention being given to the military protection of the area, this information is looked upon as having particular value at this time.

More Oil Burners
More Tractors
More Diesels
More Industrial Use
All use more oil products
More Airliners
More Cars
More Trucks
The sober facts about fuel oil supp
PLANT WORKERS, OFFICE WORKERS
You can SAVE fuel oil and avoid shutdowns
ALLIED OIL COMPANY INC.
1700 STANDARD BUILDING • CLEVELAND 13, OHIO
If everyone saves a little there will be enough for all
27 PERCENT INCREASE IN OIL BURNERS
ADDS HUGE DISTILLATE FUEL LOAD

AN ANNUAL load of 36 million barrels was added to the demand for distillate fuel oil in 1947 by the increase of 757,086 in oil burner installations. At the close of the year burners totaled 3,583,931, an increase of 27 percent in the year according to a survey by Fueloil and Oil Heat Magazine. This 36-million-barrel increase does not include the added demand for middle distillates resulting from the increase in pot-type vaporizing burners of diesel engines by railroads and industry, both of which also were booming.

Today the shelves of oil-burner dealers are loaded with shiny new conversion units, but there are few takers. The tremendous volume of oil shortage publicity in the newspapers and on the radio has made prospects shy of the salesman with an order blank in one hand and a fuel contract in the other — the fuel contract being equipped, of course, with a suitable force majeure clause.

Current shipments of burners from factories are far below the 100,000 per month achieved about the middle of 1947, and the larger companies are putting on a drive for replacement and repair of old units. In 1947 the replacement business amounted to only about 64,000 or 7.8 percent of the total sales of oil burners, but burner manufacturers are not too downhearted yet. They hope to sell a half million burners in 1948. This would be a drop of some 40 percent under last year but still a serious figure for the oil industry to contemplate in view of demands from other sources for middle distillates. It would bring automatic, force-feed burner installation up to four million and require nearly 200 million barrels of furnace oil.

With burner installations up 27 percent in 1947 and oil supplies up 10 percent, it is small wonder that the oil industry has been experiencing an unhappy winter. It has been a winter of discontent for everybody: home owner, oil distributor, refiner, burner seller and burner manufacturer, not to mention city and state health and administrative officials.

The oil industry began worrying about the shortage many months before it appeared. Some major companies started refusing new customers

as early as last June. But installations continued to be made at a high rate through the fall and early winter. The oil industry always had met every demand during the war and could be expected to do it again, they said. The price might be a bit higher, but there would be enough oil. So installations continued despite warnings until the big storms put a load on the oil industry that it was unable to carry.

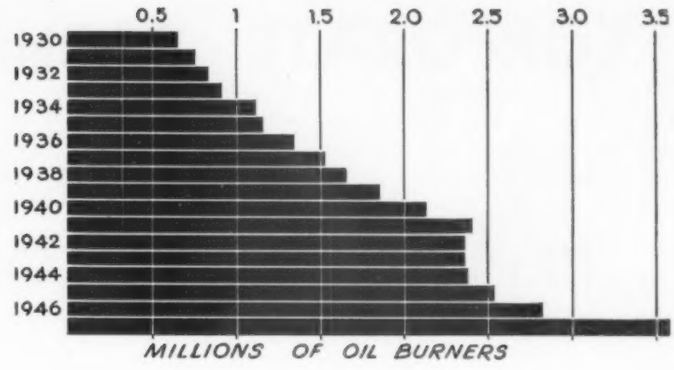
As this is written the average temperature has been only 6° below normal for the winter to date. The snow and ice storms have given the impression that the unit heating load was heavier than it actually has been. Even so, stocks of fuel oil on Gulf and Atlantic coasts were 12 million barrels below the previous year at the end of December, and before New York streets were cleared of the big snow, the Public Welfare Department was receiving from 700 to 3,000 calls daily complaining of fuel runouts. This was six or seven times as many complaints as during the war.

Efforts of the oil industry to meet the unprecedented demand have followed three main channels: (1) increasing transportation facilities without regard to costs; (2) operating refineries at overloads, and (3) changing yields to produce maximum volumes of middle distillates.

In the field of transportation the industry has purchased all available war surplus tankers, even though many of these tankers cannot be operated economically in competition with new ships now being built for the oil companies. Normal tanker movement of oil has been supplemented by high-cost tank car shipments over long distances. East coast refineries have brought in fuel oil by the trainload from Gulf Coast refineries at freight costs of around $2.52 per barrel compared with current ocean charter rates of 42 cents per barrel for the same haul. In the Middle West refiners have been shipping crude oil from West Texas to the Great Lakes because of inadequate pipeline capacity. Rail rates paid on these hauls also are far in excess of pipeline rates. It is only in times of great emergency that oil is shipped from California to the East Coast. For one reason, California is not now too well supplied with oil herself, and in the second place, the haul through the Panama Canal is some 4900 miles long, two and a half times the haul from the Gulf Coast. The charter rate is $7.75 per ton from California compared with $2.85 from the Gulf. But in the past month several cargoes of furnace oil have moved from California to the East Coast. Socony-Vacuum, for example, moved three cargoes totaling about 350,000 barrels.

The rate at which refiners have been able to operate their plants during the emergency has been astonishing. In one recent week Louisiana Gulf refineries were operating at 124 percent of rated capacity, East Coast refiners at 111 percent, and Texas Gulf plants at 104 percent. This sort of thing has been going on week after week.

More than a million new oil burners have been installed in the past two years.



Even Indiana-Illinois-Kentucky plants have been up to 95.7 percent of capacity by dint of unusual methods of bringing in raw materials.

A normal yield of distillate fuel oil at U. S. refineries in recent years has been about 15-16 percent. Before the war yields ranged from 13 to 14 percent. During the present emergency refiners have widened the gas oil and distillate fuel cut to around 19 percent, and the total kerosene and distillate fuel cut has been around 25 percent. This is getting close to the physical maximum with oil refineries constructed as they are today. The running of plants at excess capacity is one reason that middle distillate yields are as great as they are. The fact is that refiners are operating uneconomically in pushing their stills so hard. Result is that crude fractions normally finished into more valuable oils are being thrown into fuel and sold at low prices.

Public relations and advertising departments of the oil companies and of the American Petroleum Institute have done a magnificent job of presenting the industry's story to the public during the crisis. At the beginning of the season editors were supplied by the API with a file folder titled "Current Facts on Petroleum Supply and Demand." In this folder the Institute carefully documented data on supply and demand problems with a report on what the industry is doing to meet the shortage and what the public can do. Booklet was prepared by the Institute's public relations committee and distributed to consumers by the hundreds of thousands urging oil conservation and showing how savings can be made. Oil company radio programs and newspaper advertising have hammered home the necessity for reducing oil consumption. Local committees have worked on the problem in cooperation with public authorities.

There has been a great deal of teamwork on the part of the industry in spreading the available supply. Operating through central clearing houses in health departments, the oil companies have made deliveries where they were most needed without reference to whose customer was being served.

In New York and possibly in some other spots a few unscrupulous dealers have taken advantage of the shortage to sell oil at exorbitant prices. Such activity has contributed a great deal to the industry's bad press and no doubt accentuated the public outcry against higher fuel oil prices.

During the course of the winter the legitimate fuel oil markets have advanced much more than gasoline, with the result that furnace oil tank wagon prices of 12.3 cents per gallon in New York at the middle of January were only a half-cent below the commercial consumer price for tank wagon deliveries of regular grade gasoline at 12.8 cents and kerosene tank wagon prices were actually 0.3 cent higher than gasoline.

On the Gulf Coast cargo market gasoline and kerosene prices were identical at nine cents and No. 2 fuel oil a penny cheaper. In Oklahoma regular gasoline was selling at 10.5 cents, kerosene at 9.5 cents and No. 2 fuel at nine cents.

This being election year, some members of Congress are pointing to oil industry profits and asking cuts in prices. While there have been instances of unduly high prices, the general narrowing of the price margins between gasoline, kerosene and fuel oil are well justified by changes in demand ratios, and it seems likely that the three will sell at nearly identical levels until there is a material change in the present situation. But even at prices ranging from 12 to 15 cents on the Eastern seaboard and 13.5 to 14.5 cents in the Middle West, the premium over coal is so small that it may be doubted whether price will have the effect of reducing demand. Perhaps the fear of a shortage may be even more powerful in helping to reduce the dizzy climb in the number of oil burners. If neither deterrent works, the oil industry will have to do a lot of head scratching before it solves the problem.

DOMESTIC CONVERSION BURNERS AND UNITS

Year	No. in Use (End of Year)
1930	648,500
1931	747,300
1932	831,120
1933	914,280
1934	1,112,870
1935	1,152,125
1936	1,340,675
1937	1,530,545
1938	1,667,745
1939	1,862,330
1940	2,135,125
1941	2,402,060
1942	2,386,290
1943	2,375,455
1944	2,392,265
1945	2,525,655
1946	2,826,845
1947	3,583,931

CORPORATE EARNINGS and REPLACEMENT COSTS

By W. H. Garbade*

FEW subjects are currently commanding more interest in business circles than the problem of accounting for replacement costs. The question has been discussed in considerable detail in many recently published articles. It was thoroughly aired at a recent meeting of petroleum industry representatives, and it is doubtless prominent in the minds of management in every major industry.

As is inevitable with such controversial topics, all the discussions have been marked by fairly general disagreement. Few authorities in any field agree on the best method of reflecting increasing replacement costs in financial reports. And experts in accounting and other professions are choosing sides for another clash in the "battle of the footnotes."

Probably the one obvious conclusion to be drawn from all that has been said and written so far is that there is no simple cure-all for the problem. Every solution that has been proposed appears to fail in one way or another, depending on the individual case. In discussing the subject, then, it seems reasonable to sketch in the background against which the main problem revolves. In this way it may be possible to highlight the basic issues confronting management as it seeks to formulate a sound approach for individual companies.

The first factor to be considered is that earnings in America, expressed in dollars, are at an all-time high, as shown in Fig. 1. Furthermore, corporate management finds itself in the embarrassing position of explaining, defending or even apologizing for its income. Obviously, if earnings were accurate gauges of corporate efficiency, management should take full credit instead of presenting alibis. For high earnings are absolutely necessary to support America's position in a world at peace, and they are just as indispensable to the revitalizing of private enterprise.

Unfortunately, however, management can take little credit for today's earnings, because they are largely fictitious. According to the Department of Commerce, corporate earnings in 1946 totaled 12.2 billion dollars, of which inventory profits accounted for 38 percent. Add to this the distortion and exaggeration in profits caused by the use of prewar facilities in a postwar price structure, and it will be seen that profits quickly approach modest levels.

Working hand in hand with the factors just mentioned are unprecedented capital expenditures throughout American industry. Money now being spent in the United States for replacement and expansion of plant and equipment is at an all-time high. In 1947 alone corporate expenditures will total 16 billion dollars or two and a half times the normal prewar replacement capital expenditure rate of 6.6 billion. The petroleum industry spent one-eighth of this sum. But like others, the petroleum industry would much prefer to postpone present rates of expenditure until materials and manpower are in better balance with demand. In fact the capital budgets of most companies provide only for urgently needed plant replacement and expansion to take care of essential consumer requirements, both at home and abroad. It is no secret that meeting these requirements cannot be delayed any longer without serious economic and political repercussions.

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* At the time when this paper was presented before the Financial and Accounting Committee of the American Petroleum Institute in November last, Mr. Garbade was assistant treasurer of Shell Oil Company, Inc. Since that time he has been elected president of Deep Rock Oil Company.

TABLE A

Earnings of Twelve Oil Companies

1946 Actual and Adjusted 1947 Estimated and Adjusted
(Millions of Dollars)

	Earnings					Dividends					
	1946 Write-offs	1946 Reported	1946 Adjusted	1947 (b) Estimated	1947 Est. Adjusted	1946 Actual	1946 % of Earnings	1946 Adj. % Earnings	1947 Estimated	1947 Est. % Earnings	1947 Est. Adjusted % Earnings
Shell*	$ 25.0 (a)	$ 32.9	$ 20.4	$ 53.9	$ 41.4	$ 20.2	61.4%	99.0%	$ 26.9	49.9%	65.0%
Standard-N. J.	154.8	177.6	100.2	273.3	195.9	82.0	46.2	81.8	109.3	40.0	55.8
Standard-Calif.	39.6	67.0	47.2	94.3	74.5	29.9	44.6	63.3	41.6	44.1	55.8
Standard-Ind.*	51.9	67.6	41.6	91.7	65.7	26.7	39.5	64.2	30.6	33.4	46.6
Socony	66.0	58.3	25.3	93.5	60.5	23.4	40.1	92.5	31.2	33.4	51.6
Texas	58.5	71.1	41.9	84.4	55.1	33.7	47.4	80.4	33.7	39.9	61.2
Gulf	59.4	58.3	28.6	86.2	56.5	22.7	38.9	79.4	25.0	29.0	44.2
Sun	9.6 (a)	10.9	6.1	25.1	20.3	3.4	31.2	55.7	4.1	16.3	20.2
Atlantic*	24.7	9.6	(2.7)	15.2	2.8	4.0	41.7	200.0+	4.0	26.3	142.9
Sinclair*	27.6	27.6	13.8	38.9	25.1	12.0	43.5	87.0	12.0	30.8	47.8
Pure	15.1	17.1	9.9	24.1	17.0	5.0	29.2	50.5	6.0	24.9	35.3
Ohio	14.2	18.3	11.2	29.5	22.4	8.2	44.8	73.2	11.5	39.0	46.9
30 Oils (c)	716.0	763	382	1137.0	679	331.0	43.4	86.6	406.6	35.8	52.2

(a) Excludes intangible development expenses.
(b) Earnings and dividend estimates: Standard and Poor's Corp.
(c) Chase National Bank, 1946

* War Emergency Facilities written off for book purposes.
Note: Adjustment is for 50% increase in write-offs.

One of the main reasons for the unprecedented capital expenditures is the current peak in construction costs. Figure 4 shows what this means. According to the Bureau of Labor Statistics, wholesale commodity prices have now reached the World War I peak and are almost double those of the prewar years. Furthermore, the chart shows construction costs are now approximately 70 percent above their prewar levels and equally far above the peak levels reached in 1920. The graph also shows that construction costs receded only slightly following the first World War. It is doubtful if there will be any major decline from today's levels, because of advances in wage rates and the artificial restrictions against technological improvements in the construction industry.

With all these forces working against real, as opposed to apparent, earnings, it is only natural that industry should find its cash depleted. During previous booms, when capital expenditures and earnings were at record levels, corporate enterprise was able to pay generous dividends and at the same time expand plant facilities through the medium of additional capital that was either borrowed or raised through new stock issues.

Today, unfortunately, financing is not so simple. Tax rates are designed to discourage private capital accumulation and investment. The market for stocks suffered a severe setback in 1946, and investor enthusiasm has yet to recover from this blow. In other words, management is reluctant to propose new issues of common stock at today's price levels and in the face of lukewarm demand. Borrowed capital, although financially less attractive, enjoys a better market than stock, but even the market for borrowed capital is declining. Interest rates are rising faster than they have at any time during the past nine years and are naturally dampening corporate enthusiasm for additional borrowing. Consequently, in spite of a high profit level, these circumstances are forcing many companies into a rapid depletion of cash as they proceed with necessary expansion of plant facilities.

TABLE B

Investment in Plant and Equipment Per Dollar Sales—1945

Cement	$1.89
Copper Mining	1.49
PETROLEUM	1.12
Paper	.95
Chemicals	.87
Iron and Steel	.63
Railway Equipment	.58
Textiles	.55
Autos-Trucks	.38
Machinery-Plant Equipment	.34
Electrical Equipment	.32
Locomotives	.30
Tires-Rubber	.29
Food-Meat Packing	.21

Besides coping with the problems just mentioned, management today is under considerable pressure because of the simple fact that earnings do not reflect replacement costs. This pressure is bearing down from three directions—from employees, from stockholders and from internal operations. Organized labor and other employees, as well as stockholders, are "reluctant" to understand why management cannot increase wages and dividends. The reason for management's stand is graphically illustrated in Table A. After allowing for a 50 percent increase in depreciation during 1946 to provide for increased replacement costs, 30 leading oil companies paid out almost 90 percent of their adjusted earnings in dividends. If the industry continues to distribute earnings at this rate, it will eventually be forced to finance almost all new expansion, as well as increases in dividends, out of new capital, probably borrowed.

Internally, of course, all operating costs are completely distorted unless they are adjusted to reflect current replacement costs of plant and equipment. The manager who calculates his costs, profitabilities and price structure on prewar capital costs is living in a fool's paradise just as dangerous as that occupied by the businessman who budgets 1948 profits on prewar labor rates.

With a few exceptions, such as service agencies, the problems involved in accounting for replacement costs apply to industry at large. With the petroleum industry, however, the problem is a special one and for an important reason. The greater the amount of plant and equipment required by an industry, the more acute is the problem inherent in exaggerated earnings attributable to prewar charges for capital. As shown in Table B, industries require a widely varied proportion of investment in plant and equipment with regard to sales. Petroleum, with more than $1.00 of investment per dollar of annual sales, is close to the top of the list. Figure 1 shows what this means to the oil industry. With an adjustment of 50 percent in depreciation charges, oil companies' earnings, instead of representing an estimated 15 percent return on invested capital for 1947, are actually reduced to approximately nine percent,

Fig. 1

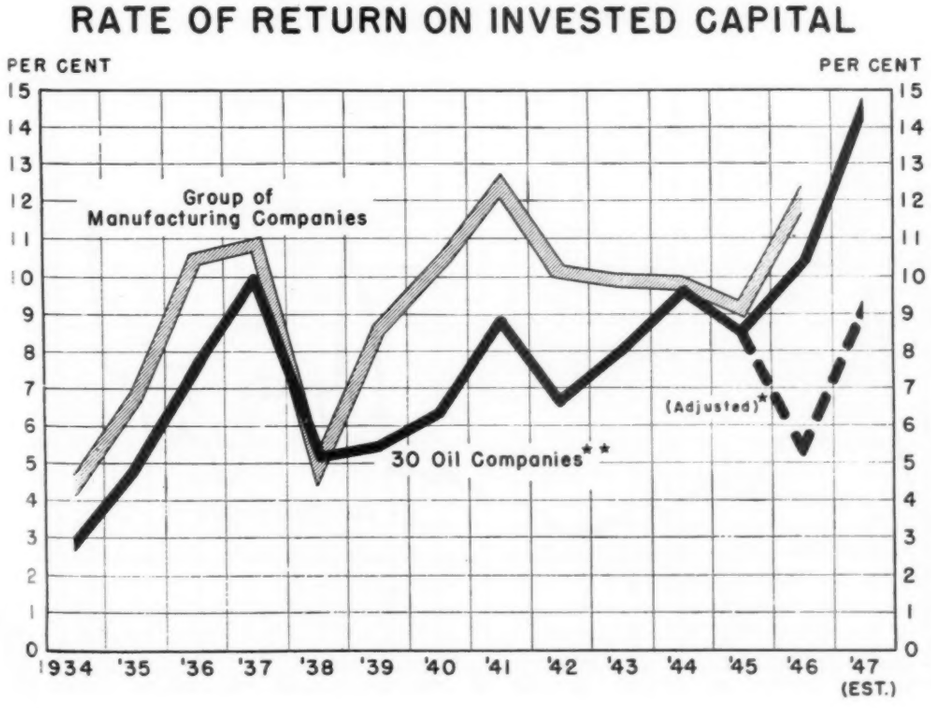
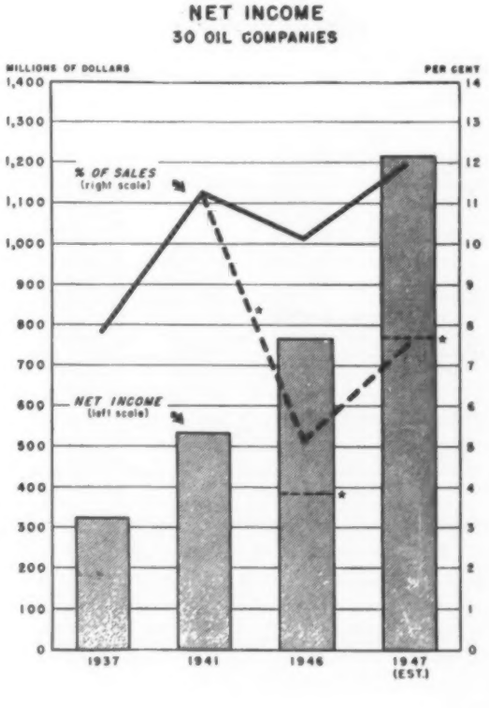

RATE OF RETURN ON INVESTED CAPITAL
PER CENT
PER CENT
Group of Manufacturing Companies
(Adjusted)*
30 Oil Companies**
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
1934 '35 '36 '37 '38 '39 '40 '41 '42 '43 '44 '45 '46 '47 (EST.)

Fig. 2



with no adjustment for invested capital base. Figures 2 and 3 show how a similar adjustment causes a drastic reduction in oil and steel earnings as a percentage of sales.

There is no escaping the fact that the problem of accounting for replacement costs is of industry-wide scope and definitely serious character. It can be summed up as follows: With no changes in today's levels of prices, wages, material costs, dividends, capital expenditures, construction costs or any other factors, under accepted accounting methods, profit and loss results will gradually decline year after year until all prewar plant and equipment have been replaced. If management sets a dividend rate equivalent to today's earnings and maintains the rate unchanged for the next ten years, it will have paid stockholders largely out of capital rather than out of earnings, obviously an unhealthy situation.

Arguments most commonly presented on the subject of replacement costs have so far represented three distinct viewpoints: those of the public accountants, those of the economists, and, finally, those of management. First, the public accountant, who thrives on principles of consistency and thoroughly tested standards of procedure, staunchly defends reported earnings without any adjustment for replacement costs. He prefers to let the chips fall where they may and to offer whatever verbal explanations may be required for retaining earnings rather than distributing them. He is convinced that whatever goes up must come down, and he argues convincingly that any sound procedure for reporting excessive replacement costs should apply with equal force to declines in construction costs.

Second come the economists and others who recognize the present as a time of unprecedented inflation and who maintain that prices, profits and values should all reflect the new postwar price plateau as quickly as possible in order to avoid deceiving anyone as to actual corporate earnings. With much justification, they argue that corporate capital replenishment will span the normal business cycle without great distortion. Today, however, America has experienced a major downward shift in the value of its currency that has penetrated the wage and price level so deeply that a complete correction is not only unlikely but highly undesirable.

And third, there is top management, stressing the immediate, practical need to state earnings in such a way that it can finance as much of its capital expenditure as possible without outside help. In this connection, seasoned observers know that prices for certain products cannot long remain at present high levels but that these same prices are now performing a vital economic function by diverting capital to the construction of sorely needed plants—plants which sometimes pay for themselves in a year in spite of outrageous construction costs. But what will happen when conditions return to what we call normal, say in 1950? Prices will be down, demand low, and the business manager will find himself living with fantastic depreciation on a plant which will produce at only half capacity for another 20 years.

Whatever theories may be advanced to meet the problem, in actual practice the method of accounting for replacement costs will probably vary from case to case. The American Institute of Accountants will apparently recommend that no profit and loss charge be established to cover replacement costs, but that some sort of surplus adjustment be made as an "appropriation" of earnings after net income has been calculated in the ordinary manner. Other concerns may set up direct charges to income, either to write off estimated "excess" costs incurred in expenditures for a single year, or to provide systematic reserves for estimated additional amounts required to replace all plant and equipment over its remaining useful life. This method provides flexibility in that reserves so accumulated may be transferred to capital surplus if construction costs tend to remain indefinitely at present levels. Still other companies will probably refer in reports to stockholders to the estimated potential amount involved without attempting to adjust earnings.

Adjustments needed to solve problems of accounting for replacement costs, of course, will vary from industry to industry and perhaps even from plant to plant. On the strength of facts and figures reviewed here, however, it appears that the overall problem is fully stated in the case of the petroleum industry. From the seriousness of those requirements, it is apparent that the problem demands intensive study.

Fig. 3

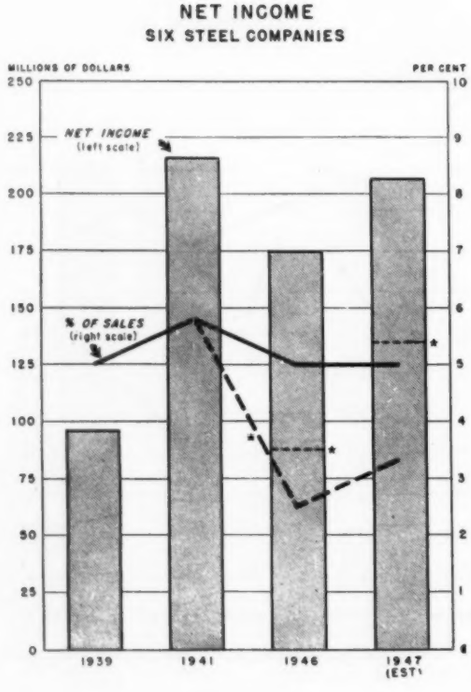
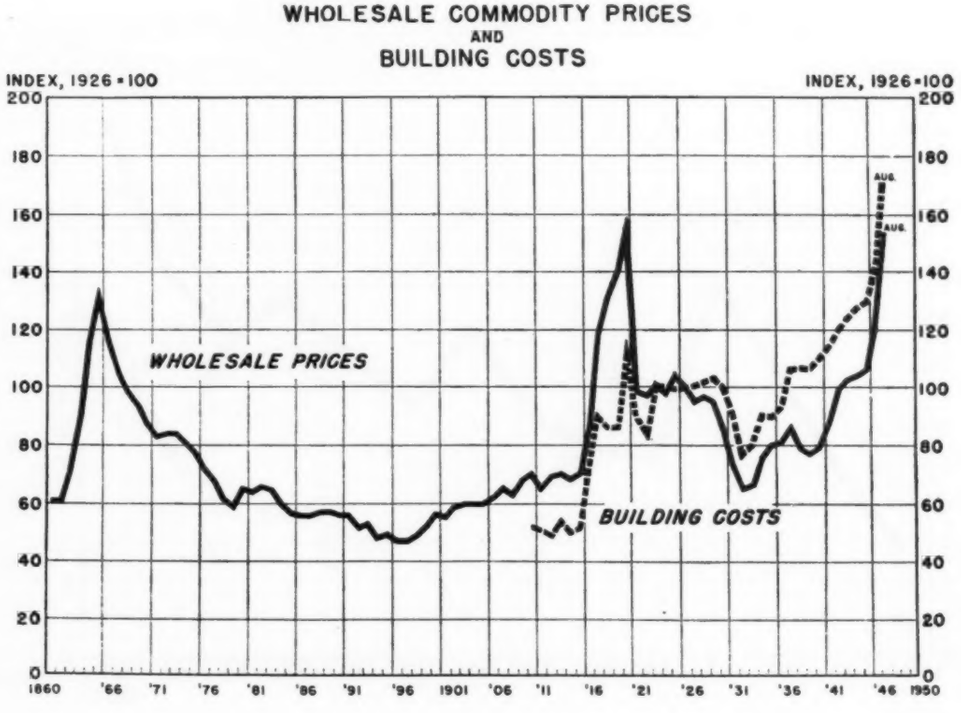


Fig. 4



BROAD EXPLORATORY PROGRAM URGED IN MEXICO

COMPLACENCY of Mexicans as to the outlook for their oil industry was severely jolted by Ing. Jorge L. Cumming, assistant chief of the exploration department of Pemex, at the meeting of oil technicians held here early in January. Warning that increasing domestic demand is outpacing production and that known reserves are headed for exhaustion in the not-distant future, he told his hearers that, unless new deposits are quickly located and put to use, the country will have to forget its dream of expanding exports and will face the necessity of becoming an importer if the present trend continues.

The candor of Ing. Cumming's statements which were made at an early session of the meeting created a decided stir, as no doubt was the speaker's intention. He asserted that unless a progressive program of production was pushed, an oil crisis would arise by 1950 which would have prejudicial consequences not only for the industry but for the national economy. Amplifying his statements, Ing. Cumming said in part:

"Mexico's oil reserves were determined for the first time after 1938 (when Pemex was established with the expropriation of the major foreign oil companies by the Cardenas government) in June, 1941, by Ing. Manuel Rodriguez Aguilar in his work entitled, 'Petroleum Reserves.' According to the calculations made in 1941 the proven reserves by zones were, in thousands of barrels: Poza Rica, 697,000; Tampico region, 153,000; Southern zone, 71,000; a total of 921,000 barrels. The most recent calculation of reserves was made during the first half of 1947 and contained in a report rendered by the Industrial Commercial Technical Expert Commission. The estimate in thousands of barrels was: Poza Rica, 932,000; Tampico region, 90,000, and Southern zone, 36,000, or a total of 1,058,000 barrels. The demand for crude to satisfy the home market according to estimates of the Home Sales Management (Pemex), and the output from existing fields that can be counted upon to meet this demand in future years, in thousands of barrels, as as follows:

(Thousands of Barrels)

Year	Demand	Output
1948	52,000	53,700
1949	55,000	51,300
1950	56,000	49,300
1951	62,000	47,600
1952	62,300	46,000
1953	64,800	44,800
1954	67,500	43,800
1955	70,200	42,800

"The situation is clear: crude production will not cover the minimum demands of the national market in a future that is perilously near unless new reserves are discovered and put into immediate exploitation. It was estimated that Mexico had at the start of 1948 a reserve of 1,010 million barrels of crude and will have during this year a domestic consumption of 52,600,000 barrels. The relation between the amount of proven reserves and production necessary for 1948 is almost at the limit of security. As domestic consumption increases annually and as the extraction of oil reduces the amount of the reserves, constant maintenance of a minimum ratio of discovery and development of new reserves is necessary. As Petroleos Mexicanos' ambition must not be held to keeping the home market saturated but must consider the country's international position and grasp the advantages of exportation when prices are favorable in normal times, and as the country must be prepared for emergencies, it is only sound policy to recommend that at least during the years 1948 to 1952 inclusive, a minimum drilling rate of 75 exploratory wells a year should be maintained. Therefore, the 150 exploration drillings that correspond to 1948-49 are obligatory to avoid the production crisis that threatens for 1950.

"Annual costs of keeping in the field 40 exploration crews with all their auxiliary services for the execution of the 75 exploratory drillings is estimated at 25 million pesos for the first year and 60 millions for the second, as the average cost per each exploration well is 800,000 pesos. Finding new reserves is an urgent necessity. The least delay will nave grave consequences. The cost of exploration is within the economic possibilities of Petroleos Mexicanos and will work out at a low price. The possibilities of production in Mexicana oil belts are certainly superior to those of the United States where intense exploration and exploitation has been carried on for many years and has resulted in the discovery of the most readily-located fields of that country, so it can be said that discovery of new reserves probably will be of relatively small deposits. In Mexico, on the other hand, only a small part of the potential oil-bearing territory has been explored, and it is reasonable to expect that new fields that are discovered will be, on an average, at least three times as great in volume of reserves as the average of those recently found in the neighboring country, so that for each successful exploration well, new reserves discovered will be on the order of 18,000,000 barrels."

The meeting of technicians was presided over by Ing. Antonio M. Amor, subdirector of Pemex, in the absence of Senator Antonio J. Bermudez, director general. In opening the convention, Ing. Amor defined its objectives in a paper edited by the Director General which said in part:

"It isn't necessary for me to call to your attention the importance and the enormous responsibility of the exploration department. The existence and prosperity of Petroleos Mexicanos is based upon the maintenance and increase of petroleum production and is the result of explorations that have been made and are being made and upon which depend the future prestige of our organization. The eyes not only of our government but of all the people of Mexico are fixed upon that, because modern life demands that all work, in factory and on farm and even in the home, depends upon oil and its products, not to mention the enormous importance to industrial development, which is a politico-economic goal of the Mexican government.

"If oil deposits are exhausted, as happens to all that the earth yields, others must be sought. That work of seeking is in the hands of the exploration department. Because of that, each member has the unavoidable duty, which is also a privilege, to do all kinds of work and even to make sacrifices with the same faith and enthusiasm with which we shoulder our task of discovering new areas capable of substituting deposits that are becoming exhausted and to increase present production.

"You have seen for ourselves in your geologic and geophysic explorations that our country still has very extensive zones in which the possibilities of obtaining oil are evident to the eye and in which only skill and technical efforts are lacking to determine the points to drill to discover new deposits, faculties that are more those of technicians who have a greater geological knowledge and geophysical experience than others. The Mexican people expect more of the oil industry, and that case is in the hands of the exploration department.

"Not only does your experience indicate the great petroleum possibilities of our country, but other experts, national and foreign, reach the same conclusion as a result of their studies. If we consider the relatively small area of the fields that are being worked and compare that with the area of potential oil lands, it is clear that, even more than a good technique, a constant effort and a firm sense of responsibility are necessary to attain happy results in other virgin zones. Mexico's industrialization which President Aleman's government is forwarding imposes a formidable task upon us, for that industrialization is impossible without a vigorous and constant production of petroleum from new deposits.

"The present scarcity of geologists specialized in petroleum which is being felt throughout the world and especially in the United States, the country most advanced in the technique of oil exploration, obliges Petroleos Mexicanos to foment by all means possible the preparation of new technicians. To afford that preparation, the general management is making constant efforts and even seeks to complement the work through the cooperation of some foreign experts.

"Upon the good understanding of the technical works of each and every one of you depend the success and good results that we expect. And to attain those the sooner and more completely, complete coordination of all explration aspects is indispensable. We expect that that coordination will be one of the results of this convention.

On some occasions the daily press of Mexico has referred to the scant success of exploration, and in truth there was some reason for that criticism, for we have not yet attained true success in the discovery of new deposits nor in an important extension of fields in production. Making those discoveries is our unavoidable job, our essential mission, and the success or failure of our job, our mission, is in the hands of the exploration department. I exhort you to work tirelessly and cooperatively to attain those objectives, not only dynamically but with dedicated enthusiasm and love of your work, for that alone will make good the faith and confidence which the people and the government of Mexico have placed in us."

In connection with the reference to the enlistment of foreign experts in furtherance of exploratory activities it was noted that on invitation of Pemex the meeting was attended by prominent geologists from the United States, including Everett DeGolyer and Lewis McNaughton of Dallas, Texas, Ralph Imlay of Washington, D. C., Paul Weaver of Houston, Texas, John Hendricks of California and Valentine Garfias of Cities Service Company. In a press conference preceding the meeting, Ing. Amor stated that the Pemex program included the employment of foreign experts and foreign companies to execute its plans for increased production. He reported that during 1947 Pemex had drilled 54 exploratory wells as compared with over 5,000 in the United States. He explained that Pemex is limited by lack of available technical experts and equipment, and as there is no immediate solution to that problem within Mexico, foreign aid must be enlisted.

Geologist Edmundo Zepeda presented a paper before the meeting on exploration in Sierra Madre Oriental, the mountain range along the central Gulf coast, which attracted much interest. Supplementing his talk with plans and drawings demonstrating oil migrations, he asserted that oil deposits tend to descend to the coast levels and counselled Pemex to drill its exploratory wells deeper than it has in the past. He recommended that Pemex extend exploration along the Vera Cruz coast, increasing its work at Poza Rica, which he pointed out has been its most prolific field up to date. He expressed confidence that such exploration will locate important oil deposits.

The visiting Americans applauded talks on geological, geophysical and petrographic work by Engineers Federico Mina and G. P. Salas, Hugo Contreras, A. Lopez Vazquez, Raul Perez, E. Lopez Ramos, Guillermo P. Salas and M. Alvarez, and frequently supplemented these talks with data and explanations. It was stressed that Pemex must adopt a policy of drilling in unproven zones and in those where the expropriated foreign companies had started drillings but had not completed them.

Ing. Manuel Rodriguez Aguilar, chief of the exploration department of Pemex, gave a talk on the basin of the Burgos River, Tamaulipas, reporting that signs of oil had been found there, particularly on La Soledad ranch. E. Lopez Ramos suggested the advisability of exploration in the region of the famous "Faja de Oro" (Golden Lane) along the central Gulf coast, which was a big producer early in the century, arguing that the zone can again yield importantly. Lopez Vazquez suggested exploration north of Tampico.

At the banquet given as the final event of the meeting to those who attended, Senator Bermudez urged an intensification of oil search in Mexico. Speaking briefly, the Pemex chief declared that "the eyes of the whole world and the Mexican people are fixed upon the petroleum potentialities of our country." He stressed Mexico's wealth and the steps the Aleman government is taking to put that wealth to work for the good of the country through its plan for economic recuperation. Senator Bermudez felicitated the delegates on the success of the convention and expressed appreciation to the foreign technicians for their collaboration in the effort to expand Mexican production.

It was learned that, in accordance with proposals urged at the meeting, a broader program of exploration is being prepared for this year. There are indications that technicians and companies of the United States, as well as some other foreign individuals and firms, will participate in this program. There is some conjecture as to how this proposal will fit in with the "labor solidarity" pact just concluded by the country's big three unions—the oil workers, the miners and the railroaders. The announcement of the labor alliance said that this consolidation is neither communistic nor anticommunistic but is "the fight of the people for the people." Nevertheless, much leftism is seen in the agreement, and in some quarters it is viewed as the prelude to a general strike.

New York Nomad Officers

At the meeting of the New York chapter of Nomads on January 5, officers were elected for the coming year. The above photograph shows (left to right) Stewart Beckley, secretary; Henry J. McAdams, vice president; J. W. Reed, regent; A. V. Simonson, retiring president who now becomes a regent; Val R. Wittich, Jr., president; W. D. Robinson, sergeant-at-arms; Russ V. McIntire, assistant secretary; Joseph B. Roberts, Jr., treasurer; Charles P. McDonald, Jr., assistant treasurer. Marvin D. Rasher, assistant sergeant-at-arms, was not present when the photograph was made.

To Write Standard History

Dr. Paul H. Giddens of Allegheny College, has been granted a 2-year leave of absence from teaching to write a history of the Standard Oil Co. of Indiana. The research writing project was begun at Chicago on Feb. 1 under a grant to Allegheny by Standard which allows the author complete academic freedom with access to all Standard records.

Dr. Giddens is head of the history and political science department at Allegheny and curator of the Drake Museum at Titusville, Pa. In 1945 he was awarded a Guggenheim fellowship to write his "Growth of the Petroleum Industry, 1870-1895." He also has written "The Beginnings of the Petroleum Industry: Sources and Bibliography," "The Birth of the Oil Industry" and "Pennsylvania Petroleum 1750-1872: A Documentary History."

New Egyptian Field Producing

The newly developed field in the Sudr district of the Sinai peninsula is being brought into production by Anglo-Egyptian Oil Co., Ltd., and Socony Vacuum Oil Co. Production from the wells completed thus far will be at the rate of about 5,000 barrels daily.

First well in this field was completed in 1946 at a depth of 3,157 feet. Production on the pump was at the rate of 367 barrels daily of 24.5 gravity oil.

The second well was drilled to 7,029 feet where it had an initial production of 605 barrels of 23.3 gravity oil through a half-inch choke. Greatest production to date is from the sixth well to be drilled which came in at the rate of 4,700 barrels daily through a three-quarter-inch choke at 2,658 feet.

Producing area proven by the six wells drilled to date is about 6,000 feet long by 2,500 feet wide. Oil is from Miocene and Eocene formations with reservoir energy believed to be largely supplied by water. The field is about 35 miles south of Suez. Oil is being processed at an Egyptian refinery.

C. W. OVERTON, Tulsa, a veteran of 22 years' service with Standard Oil Company (N. J.) affiliates, has been elected vice president and director of The Carter Oil Co. in charge of its marketing department. The marketing department headquarters is being transferred to Denver, Colo., from Tulsa. Carter markets its petroleum products in the northwestern states. Mr. Overton succeeds F. W. Butler, who has moved to New York with Jersey Standard.

FIRST TURNAROUND OF SMALL TCC UNIT

By JOHN S. PFARR
Technical Director, Leonard Refineries

THE first turnaround of the Leonard TCC unit has recently been completed with an expenditure of only 4,557 manhours. Following an initial run of 222 days, during which time the unit had an on-stream efficiency of 96.4 percent, a complete inspection of the plant was begun on Oct. 27, 1947. Using only 40 men per day, two crews of 20 men each, the work of the turnaround was completed in 10½ days. Of the 40 men used, 29 were from the refinery maintenance force and 11 from the operating personnel of the unit. Operation of the plant was resumed on Nov. 6, 1947.

During the initial run several interruptions of short duration in the operation of the plant occurred. A complete itemization of all off-stream is presented in Table 1. Reasons for the off-stream periods were of a minor nature, and out of a total elapsed time of almost eight months, only 116 hours of off-stream time were attributable to the catalytic section of the plant.

In order to prepare the TCC plant for operation throughout the winter months, the general turnaround was originally scheduled for the end of September. However, the heavy demand for refinery products necessitated that the operation of the unit be continued for an additional month.

In order to expedite the work of the turnaround, a well-defined program of inspection was arranged prior to the shutdown. Through conferences held at the refinery, Houdry and Leonard representatives scheduled the shutdown procedure and the sequence of activities of the various mechanical crafts.

Since March 1947, when the unit was put into initial operation, the charge to the plant has consisted principally of Reed City and Adams reduced crudes which have sulfur contents of the order of 0.9 Wt. percent. After being preheated to about 840°F in vaporizing heaters, the reduced crude charge is flashed in a tar separator to produce a tar separator overhead vaporized charge for the catalytic reactor and a heavy bottoms product which is subsequently processed into asphalt and heavy fuel oil components. The overhead and bottoms product from the tar separator flash have average sulfur contents of 0.6 Wt. percent and 1.1 Wt. percent respectively. Thus the sulfur content of the reduced crude charge and fractions thereof have been sufficiently high that some corrosion of the processing equipment was anticipated from this source. The results of the recently completed inspection, however, are particularly gratifying in that, as discussed below, a minimum use of alloy steel for protection against corrosion is indicated to insure the continued satisfactory performance of the plant.

Table 1

On Stream Efficiency Summary

Cause of Off Steam Time	Hours
Stabilizer Clean-Up	48.0
Blower Maintenance	41.3
Circulating Water Pump Failure	63.7
Power Failures	26.7
Clay Hold-Up in Reactor Seal Leg	11.3
Total	191.0
Total Hours On Stream	5140.2
Total Hours Elapsed	5331.2
On Stream Efficiency	96.4%

The turnaround comprised a complete inspection of all items of equipment in the TCC plant —from the charge pump to the final stabilizer in the gas plant section. Pertinent data concerning the manhour requirements for the shutdown work are presented in Tables 2, 3, 4 and 5. Out of a total of 4,557 manhours, 2,954 manhours were spent in the inspection and maintenance of conventional refinery equipment such as valves, pumps, gas compressors, heat exchangers and fractionating towers, and only 425 manhours were required for inspection and repair work on equipment in the catalytic section. Furthermore, because of the excellent mechanical condition of the unit, the major portion of the work was accomplished with unskilled labor as illustrated in Table 3. The distribution of manhours expended on the catalytic section according to items of equipment and also according to mechanical craft, is shown in Tables 4 and 5.

Actually two of the items of work performed during the shutdown do not come under the category of inspection and repair since they involved changes in equipment design for new processing schemes to be employed in the plant. These were piping changes in the steam superheater sction of the vaporizing heaters and the installation of liquid feed apparatus in the TCC reactor. With recent reduced crude charge rates to the vaporizing heaters nearly twice that for which the equipment was originally designed, it was found that there was an excess of steam superheating capacity in the heaters. Therefore, during the shutdown half of the steam superheating coils were connected in series with the convection section reduced crude oils in order to increase the heat input to the charge and at the same time reduce the steam superheating surface to the desired amount. The liquid feed apparatus, which required slight modification of the reactor internals, was installed to permit the future processing of non-vaporizable stocks in the TCC unit. For example, in the near future it will be possible to charge to the TCC reactor the overhead product from the vacuum flashing of the tar separator bottoms stream. The manhours required for these two design changes amounted to 496. Therefore, the grand total manhours expended during the turnaround was 5,053, 4,557 for inspection and repairs and 496 for design changes.

Table 2

Manhour Requirement For Total Plant By Job Item

Job Item	Manhours
Turnaround	
Inspection and Adjustments to Catalyst Elevator	75
Miscellaneous Work on Kiln and Reactor	350
Sandblasting Gas and Water Separator	285
Painting Inside Gas and Water Separator	48
Replacement of Tar Separator Bottoms Lines	501
Replacement of Heater Transfer Lines	344
Miscellaneous Work on Valves, Pumps, Instruments, Electrical Equipment, Gas Compressors, Heat Exchangers, Coolers, Fractionating, Towers, etc.	2954
Sub Total	4557
New Installation and Revisions	
Liquid Feed Installation	275
Steam Superheater Piping Changes	221
Total	5053

The low manhour requirement for the turnaround is in itself evidence of the sound design and construction of this type of TCC installation.

Inspection revealed that a few panels of wall insulation in the kiln showed a slight amount

Table 3

Manhour Requirement For Total Plant By Craft

Craft	Manhours
Turnaround	
Welders	200
Machinists	912
Instrumentation and Electrical	216
General Labor	3229
Sub Total	4557
New Installation and Revision	
Welders	302
Machinists	40
Instrumentation and Electrical	4
General Labor	150
Total	5053

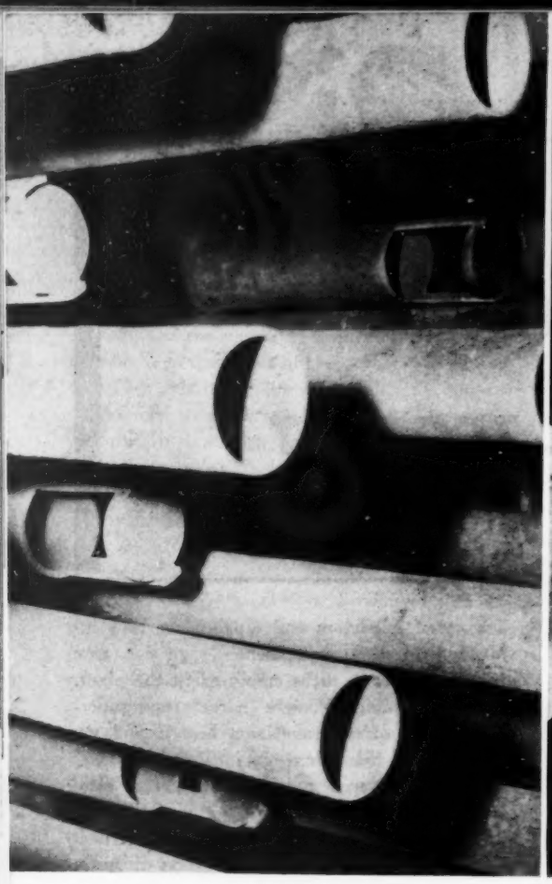


Fig. 1. Vapor and catalyst tubes of the disengager in the bottom of the reactor photographed at end of first run.

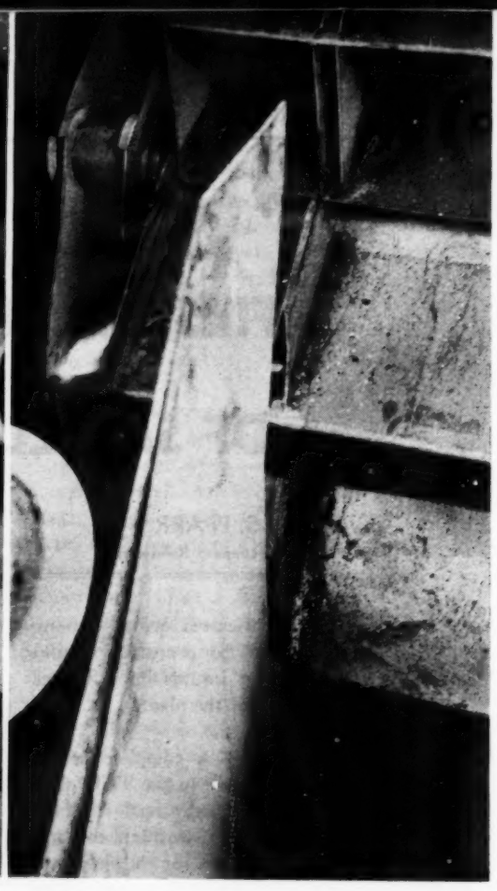


Fig. 2. Elevator and chain assembly passing over head shaft at top of structure. Little work was required on this.

of erosion. These were repaired with the field application of Panelclad, a new plastic insulation. No mechanical repairs were required on any of the air inlet distributing channels, flue gas collecting channels or water-cooling coils of the kiln. All catalyst lines to and from the kiln were thoroughly inspected for possible loss of metal due to erosion and found to be in perfect condition. Likewise, all air and flue gas lines to and from the kiln were inspected to determine the condition of the internal insulation. Again no repair was required since the insulation was found intact throughout.

The TCC reactor was also throughly inspected for mechanical defects. Measurements indicated no loss of metal from the reactor shell or internal metal elements from either erosion or corrosion despite the fact that a charging stock of a relatively high sulfur content had been processed. This was particularly encouraging since all parts of the reactor are fabricated of carbon steel. Figure 1, which shows a portion of the vapor and catalyst tubes of the disengager in the bottom of the reactor, is typical. As mentioned above, the most extensive work in the reactor was the installation of liquid feed apparatus. On the reactor wall above the catalyst bed a deposit of coke was found which was removed without difficulty.

The new split bucket-type elevator fulfilled all expectations by functioning entirely satisfactorily throughout the 222-day run. None of the off-stream time during the run was due to failure of the elevator mechanism. Moreover, the routine inspection and adjustment of the elevator during the turnaround required the expenditure of only 75 manhours. Figure 2 is a view of the elevator chain assembly passing over the head shaft at the top of the structure. The bucket partitions, chain links and traction rim may be seen. The baffles in the foreground of the view are the means by which the regenerated and spent catalyst contents of each bucket are diverted to the kiln and reactor hoppers respectively.

Measurements of the loss of metal from the traction rims on the head shaft as well as from the elements of the chain links indicated that the elevator would operate for a considerable time before a major overhauling was required. For example, the total elongation of the chain during the eight months of operation was only four inches, equivalent to wear on each of the pin and bushing assemblies of a few hundredths of an inch. The chain knuckles, which contact the traction rims and are subject to more severe initial wear, showed an average loss of metal of about 0.06 inch, and the traction rims themselves had lost only 0.017 inch of thickness. Following the inspection, a few adjustments were made to the head shaft, after which the elevator was closed up and returned to service.

The three largest items of repair during the turnaround were the renewal of sections of the transfer lines between the heaters and tar separator, the renewal of the hot tar lines from the bottom of the tar separator and the cleaning and adjusting of the wet gas compressors in the gas plant.

In the original study of this TCC installation, it was recognized that the sulfur content of the charging stocks which would be processed might be high enough to necessitate the use of alloy steel construction in many parts of the system. However, a decision was reached at that time to use carbon steel in several places and determine by experience those critical points where the use of alloy steel was necessary. As previously mentioned, the results of this inspection were gratifying in that severe corrosion was found to have occurred in only the heater transfer lines and tar separator bottoms lines. During the turnaround, these lines were replaced with 4-6 percent chrome alloy steel pipe. In this connection there was an interesting observation that these lines operated within the critical temperature range for corrosion by the plant charging stocks. For example, the return line from the tar quench cooler to the tar separator showed no corrosion whereas the other tar lines which operate above 600°F were severely corroded. Figure 3 shows the Houdry metal inspector calipering the return bends of the vaporizing heater tubes.

The Ingersoll-Rand wet gas compressors required thorough cleaning of both the power and compression sides. There were heavy sulfurous deposits on the suction valves of the compression cylinders from the hydrogen sulfide content of the gas processed. Actually a large percentage of the 912 manhours charged by machin-

Table 4

Manhour Requirement For Catalytic Section By Job Item

Job Item	Manhours
Turnaround	
Unheading and Heading Vessels, etc.	144
Elevator Inspection and Adjustment	75
Reactor Clean Up	72
Repairing Flue Gas Compressor	30
Instrument and Electrical Maintenance	24
Circulating Water Pump Inspection and Repair	18
Kiln Insulation	16
Steam Drum Clean Up	12
Kiln Clean Up	10
Make Uu Water Pump Reair	8
Miscellaneous	16
Sub Total	425
Liquid Feed Installation	275
Total	700

Table 5

Manhour Requirement For Catalytic Section By Craft

Craft	Manhours
Turnaround	
Welders	38
Machinists	85
Instrumentation and Electrical	24
General Labor	278
Sub Total	425
Liquid Feed Installation	
Welders	180
Machinists	36
General Labor	59
Total	700

ists during the turnaround was due to the maintenance required on the gas compressors.

The inspection of the gas and water separator tank revealed a slight pitting on these portions of the shell which are in contact with the water layer. This circumstance was corrected by sand blasting the lower half of the horizontal 10 x 40 separator and coating it with a protective plastic paint. This equipment is considered to be the most unconventional of the plant. Instead of passing the overhead vapors from the synthetic crude tower through the conventional shell and tube condensers, a direct-contact, barometric type condenser is used. The cooling water and hydrocarbon streams are discharged into a tank where separation of the condensed gasoline and water takes place. In addition to providing many operating advantages, the inspection of this equipment indicated that a large amount of maintenance, material and labor was saved over that which would have been expended with the regular type shell and tube condensers. Based upon the experience of other refiners, the amount of hydrogen sulfide in the overhead vapors would probably have necessitated retubjng the bundles after eight months' operation. At the present time it is fully expected that the barometric type condenser and the saparator tank will last the life of the unit and require only very minor repairs.

All of the fractionating towers in the plant were inspected and found to be in good condition. For example, there was practically no coke or catalyst fines in the bottom of the synthetic crude tower. This fact speaks well for the efficiency of the catalyst-vapor disengager in the bottom of the reactor, since, for extended periods during the initial run, the charge rates to the reactor were considerably in excess of that for which the equipment was originally designed. The acidizing of the absorber was the only tower maintenance performed during the turnaround. Figure 4 shows workmen engaged in removing the top head from the tar separator to permit inspection. A portion of the synthetic crude tower may be seen in the right foreground of the same photograph.

All coolers and heat exchangers were opened, inspected and, where necessary, cleaned. There was not an excessive amount of fouling in any exchanger. The circulating quench exchangers were conspicuously free of any deposits of catalyst fines. The water sides of all water coolers were acidized.

A nominal amount of pump maintenance was required. Serious corrosion, similar to that which occurred in the hot tar lines, had also occurred in the hot tar pump, necessitating the replacement of fittings in the liquid end of the pump. Other pumps required routine servicing and some, because of their excellent performance during the initial run, were not even opened for inspection.

There was essentially no instrument maintenance required during the turnaround. The tabulated data show a total of 220 manhours for instrument servicing, of which a large percentage was expended in replacing orifice plates in the plant to accommodate the higher charge rates which have been and will be maintained.

Leon Harris, the maintenance superintendent of the Leonard organization, spent much of his time during the construction of the plant familiarizing himself with the unit and planning for the first turnaround. He was confident that it could be done with his own small force. Mr. Harris now states that he is certain that on a year-around basis, the manhours of repair, maintenance and construction on the catalytic plant will be considerably less than that formerly expended on the thermal unit.

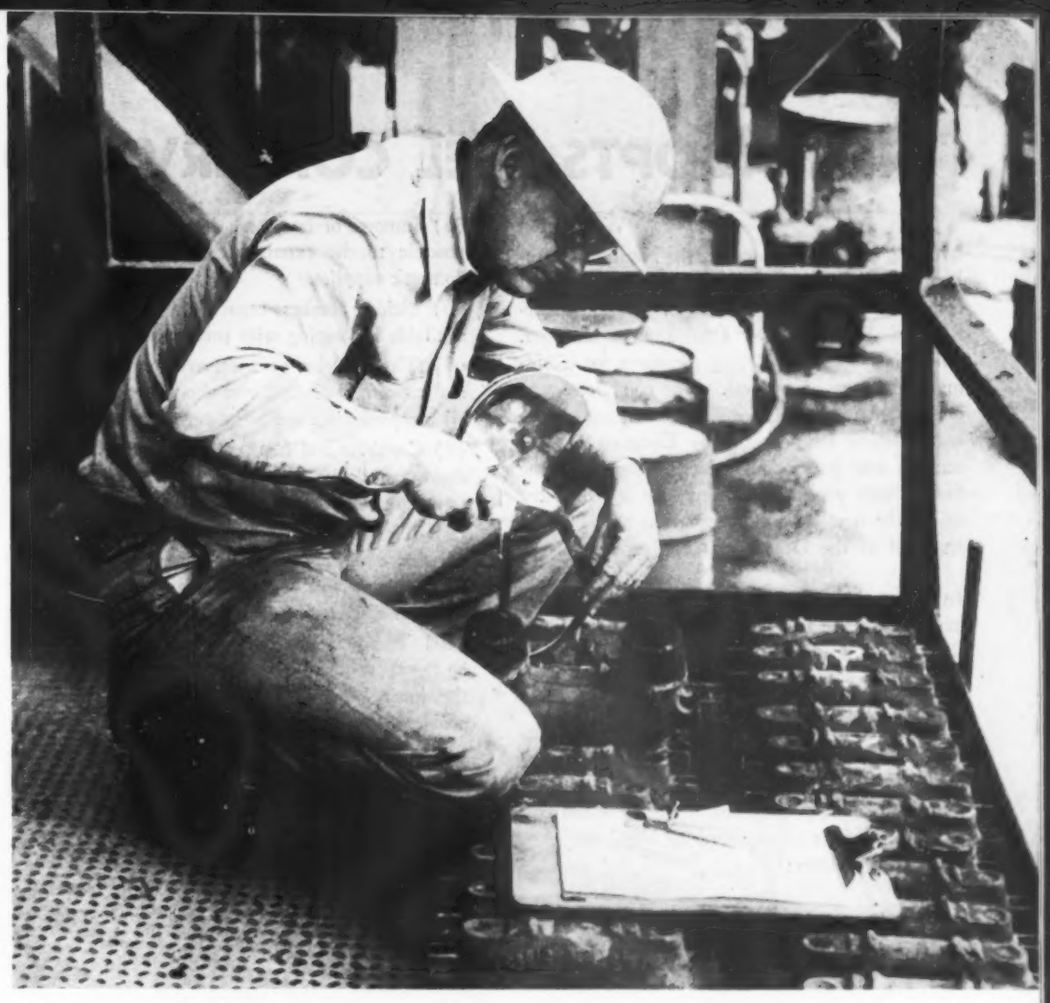


Fig. 3. Houdry metal inspector calipering return bends of vaporizing heater tubes.

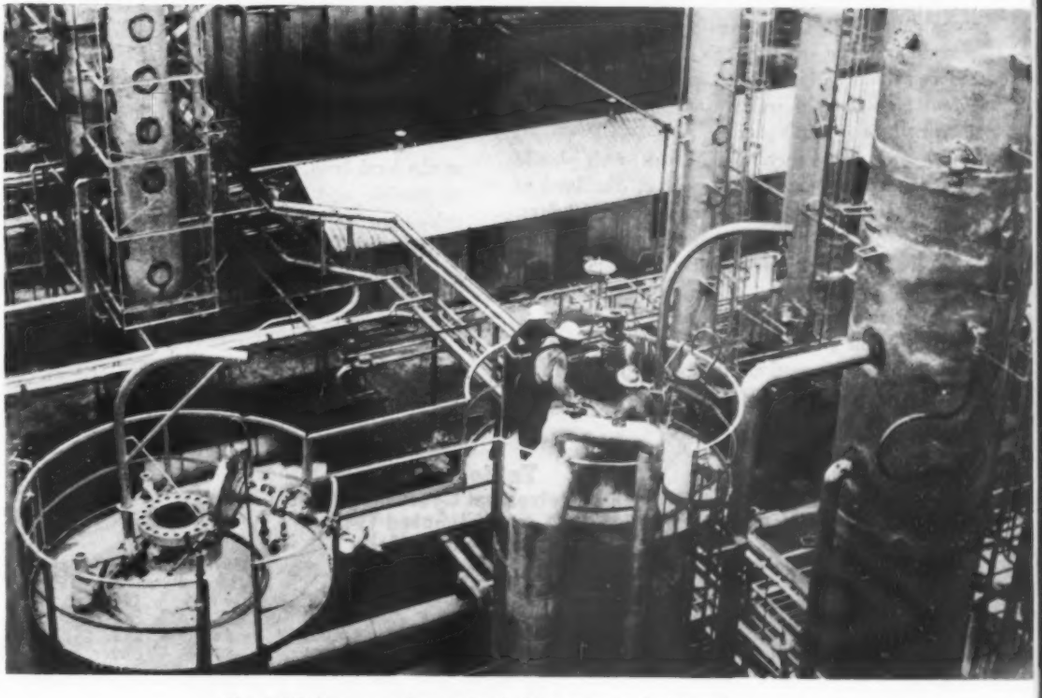


Fig. 4. Workmen removing top head of tar separator for inspection.

NPC ADOPTS FUEL CONSERVATION PROGRAM

Washington

Meeting here on January 22, the National Petroleum Council adopted the report of its special committee headed by Robert E. Wilson, chairman of Standard Oil Company of Indiana, which has been considering measures for avoiding a shortage of fuel oil. The committee was established in accordance with provisions of the anti-inflation law enacted by Congress in December, and its recommendations constitute the first definite program submitted by any industry under the new law. The program now has the approval of the Department of Justice.

In the main the report codifies proposals that have been urged and to some extent adopted since the fuel oil situation began to assume a serious aspect. For immediate relief it recommends the stepping up of distillate production by refineries at the expense of gasoline yields. On a more controversial point it advises that the growth of demand for middle distillates be checked to balance the industry's production. The committee's recommendations as approved by NPC are summarized as follows:

(1) State regulatory commissions should be urged to establish allowable crude oil production equal to maximum efficient rates, in each state east of the Rocky Mountains.

(2) Refineries operating east of the Rocky Mountains should maximize crude runs during the next 60 days, to the extent crude oil can be made available, even though such action may reduce substantially crude oil inventories. The recent high level of refinery operations should be maintained if at all possible.

(3) Refineries operating in this area should further adjust upward the yield of distillates at the expense of gasoline during the next 60 days. The committee recognizes that this action will largely shift the supply problem from middle distillates to gasoline, but it is felt that such recommendation is in the public interest.

(4) The oil industry should have sufficient steel to enable it to continue its expansion program; otherwise the nation's entire economy will be retarded.

(5) Imports of crude oil should be increased if possible to the extent necessary to supplement domestic supplies.

(6) Added tanker capacity should be made available in keeping with present plans.

(7) The practice of a seven-day-week loading and unloading of tank cars should be adopted by all companies for a 60-day period.

(8) Continue and further extend exchanges and short-term loans of petroleum products to save transportation.

(9) Available fuel oil supplies should be distributed equitably among the various categories of customers and channels of distribution at all levels of distribution.

(10) The handling of hardship cases indicated by the short supply situation should be treated at the local level by those who understand the problem.

(11) Further cooperation in the conservation program should be stimulated among both industrial and domestic consumers by various suggested means.

(12) All consumers, both domestic and industrial, who have alternate or standby heating equipment which could use other fuels should be urged to utilize such facilities.

(13) The rate of growth of demand for middle distillates must be checked and more nearly balanced with the industry's production of these products.

(14) All types of customers must appreciate the necessity of inventory reduction during the next 60 days to build up stocks to relieve hardship.

(15) All units of the industry should instruct their representatives to cooperate with committees at the local level, to relieve hardships as quickly as possible and to prevent hardships from developing.

(16) Exports should be limited to the extent possible consistent with overall necessities of our international relationships.

(17) Gasoline consumers as well as fuel oil users should adopt conservation measures.

(18) *Either the Secretary of the Interior or the chairman of the National Petroleum Council, with the approval of the Secretary, may appoint special committees from the industry as needed to advise local, state or federal authorities or the industry with regard to the application of the principles set forth in the committee report. Units and individuals of the industry should be authorized to serve on such committees or on committees appointed by local or state authorities and should be authorized to take concerted action as may be deemed necessary to carry out the recommendations contained in this report. For the present, the chairman of NPC, with the approval of the Secretary of Interior, is requested to appoint regional advisory committees in PAW districts I, II and III.

It was further recommended that within the next 90 days the NPC committee review the accomplishments under its program and after considering actual experience, develop a plan to meet the gasoline situation during the summer and the heating oil supply program next winter.

The committee on voluntary petroleum allocation agreements in its report showed that the current problems stem from the rapid growth in the demands for all petroleum products, and in particular for middle distillates, is indicated by the increase in the numbers of petroleum consumption units, as shown in Table I.

In an effort to meet this upsurge in demands the industry has made much progress in its development and expansion program as indicated by the following table. The committee said that few major industries have been able to approach the substantial gain shown over 1941.

Today's supply problems, said the committee, are most acute in that section of the country north of the Missouri and Ohio rivers and in the Atlantic states where the growth in winter demand has been greatest and the long hauls from producing areas have caused transportation problems. Even within this tight supply belt there are many local areas where supply problems are not encountered. The rate of growth of demand has not been constant in various communities, while transportation facilities to serve the markets are much more adequate in some areas than in others. Therefore, corrective measures must recognize the different nature of the problems in different areas.

It is emphasized that no committee or agency can devise plans or programs that will increase the available supply of petroleum, in a sufficiently short period, to eliminate the existence of many local problems. The committee stressed that it is necessary, therefore, that these problems be attacked promptly, area by area, on a decentralized basis. It was pointed out that care must be exercised that any steps taken be designed in such a manner as to preserve the incentives and initiative of all suppliers. Many unique but successful practices already have been adopted that have resulted in alleviation of hardships.

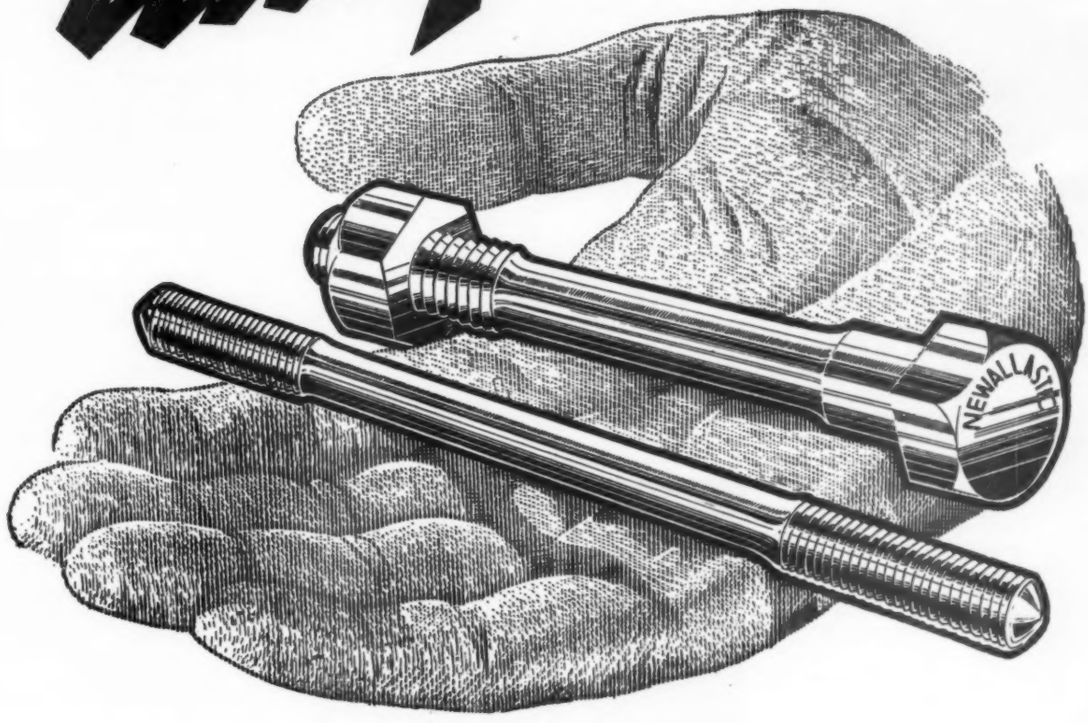
Table 1
Growth of Petroleum Consuming Units
1941-1946 and Estimated 1947
(In thousands of units)

Consumption Units in Use	1941	1946	1947	1947 % Increase Over 1946	% Increase Since 1941	
					1946	1947
Passenger cars	26,713	26,901	28,416	5.6	0.7	6.4
Trucks, buses	4,682	5,680	6,000	5.6	21.3	28.2
Tractors	1,783	2,672	2,844	6.4	49.9	59.5
Space heaters	2,000	3,035	4,250	40.0	51.8	112.5
Oil burners	2,269	2,673	3,200	19.7	17.8	41.0
Diesel locomotives (Units)	1,032	4,196	5,281	25.9	306.6	411.7

Table 2
Expansion of Petroleum Supplies Consumed
1941, 1946 and Estimated 1947
(In 000's B/D)

	1941	1946	1947	1947 % Increase Over 1946	% Increase Since 1941	
					1946	1947
Gasoline	1,903	2,138	2,289	7.1	12.3	20.3
Kerosene	199	268	297	10.8	34.7	49.2
Distillates (Heating oils)	520	746	877	17.6	43.5	68.7
Residual fuel	1,089	1,333	1,436	7.7	22.4	31.9
Crude runs to stills	3,861	4,740	5,047	6.5	22.8	30.7

Unique



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POSSILPARK GLASGOW · N

International News Notes

Sir Frederick Godber

Takes Shell Chair

Sir Frederick Godber has been appointed chairman of Shell Transport and Trading Co., Ltd., at the age of 57. Sir Frederick joined the Shell organization in 1904 and gained his experience in the oil industry in the United States. In 1921 he became president of Roxana, the name of which was changed to Shell Petroleum Corp. in 1928 and later in 1939 to Shell Oil Co., Inc.

In 1928 he returned to London and became director of the following companies: Shell Transport and Trading Co., Asiatic Petroleum Co. (now Shell Petroleum Co.), Anglo-Saxon Petroleum Co., B.P.M., and Shell Union Oil Corp. He was made a managing director of Shell Transport and Trading Co. in 1934.

During the war he was chairman of the Overseas Supply Committee of the Petroleum Board for which services he received his knighthood.

Drilling In England

D'Arcy Exploration Company, a subsidiary of Anglo-Iranian Oil Company, Ltd., will continue its search for oil in Britain by drilling at Portsdown, near Plymouth. A bore hole sunk in that district to a depth of 6,556 feet gave some oil showings, and a more recent seismic survey led the company to make another attempt about a half mile from the original site.

The drilling outfit to be used in the new test is being removed from a bore in the London area which was discontinued on January 13 at 2,680 feet. The well was drilled through fossiliferous Devonian shales and thin limestone. It gave small gas shows and provided useful geological information.

H. W. Rowbottom Retires

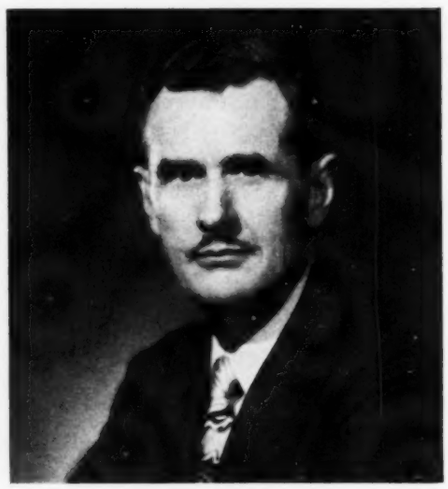
H. W. Rowbottom, general manager of the marine department of the Anglo-Saxon Petroleum Co., Ltd., has retired at the comparatively early age of 58 after over 40 years service.

Mr. Rowbottom's association with the Shell Group began with his joining the firm of M. Samuel and Company at a time when they were acting as managers of The "Shell" Transport & Trading Co., who were then operating the "Shell Line" of tankers. On the amalgamation of Shell and the Royal Dutch Company in 1907, the Anglo-Saxon Petroleum Co. was formed to take over, among other things, all shipping. M. Samuel & Co. thereupon relinquished the management of The "Shell" Transport & Trading Co., their staff being divided between the Anglo-Saxon Petroleum Co. and M. Samuel, Mr. Rowbottom remaining with the latter company. Shortly afterwards he went to Japan with the affiliated company of Samuel Samuel & Co. and served in a number of branches throughout the country. Mr. Rowbottom had a miraculous escape during the devastating earthquake of September, 1923, in which unfortunately his first wife was killed. He returned to London in 1924 and was transferred to the Shell Group, holding various managerial posts.

At the outbreak of war, in addition to his other duties, Mr. Rowbottom took over the management of the shipping interests of the Shell Group. Since then he has been responsible for the building of new tankers, the replacement of vessels lost or damaged during the war and the purchase of new and second-hand vessels.

Mr. and Mrs. Rowbottom are spending a long holiday in South Africa after which they will retire to their home in Sussex.

FRANK A. VERNON, manager of the Socony-Vacuum Oil Co. lubricating oil section, West Africa division, has retired. Joining the company as inspector on the West Coast of Africa in 1926, Mr. Vernon became assistant manager of the French and Belgian Congo area and was in charge of the lubricating oil section when the West Africa division moved from Lisbon to New York City in 1940. Mr. Vernon will live in Portugal.



Gavin Witherspoon

GAVIN WITHERSPOON has been elected vice president of Bahrein Petroleum Co., Ltd., in charge of producing activities. Mr. Witherspoon entered the foreign petroleum field in 1936, first as petroleum engineer in Arabia and Bahrein and later as assistant manager in Arabia. After a period of other assignments in the United States, he became manager of producing operations for Bahrein in 1944.

R. J. E. DODDS has been appointed general manager of the marine department of Anglo-Saxon Petroleum Co., Ltd., to succeed H. W. Rowbottom, retired. Mr. Dodds joined the oil industry in 1920 as assistant wharf master for Mexican Eagle Oil Co. at Tampico, following distinguished service in the British Navy during World War I.

In 1925 Mr. Dodds took over the management of all Mexican marine operations for the company, and after expropriation he returned to London as manager of shipping for Anglo-Saxon. During the late war he served on many marine committees and made a number of trips to the United States, the West Indies and France to aid in speeding oil shipments to the fighting forces.

G. A. KELLENBERG and R. P. Green have been appointed assistant comptrollers of Arabian American Oil Co. Mr. Kellenberg, who joined Standard Oil Co. of Calif. in 1930, has been chief accountant for Aramco since 1944. He served as chief field accountant for two years prior to that in Saudi Arabia. Mr. Green has been an auditor for Aramco for the past year and a half. He formerly was with The Texas Co. Mr. Kellenberg was succeeded as chief accountant by Leslie C. McClaskey, formerly of the Creole Petroleum Corp.

HENRY FORIEN, chairman and general manager of Shell d'Alger, has been transferred to Paris as chairman and general manager of Societe Routiere Colas. He was succeeded at Algiers by Claude Thomas.

Mr. Forien joined Shell in 1927 and has served in Algeria since 1928. He was made a member of the management in 1935 and general manager in 1945. During the past two years he has been chairman of the Groupement des Importateurs de Petrole in Algerie and of the Groupement pour Achat et de Repartition des Produits Liquides.

ERIC N. AVERY has been appointed general manager of the Shell Co. at Australia, Ltd., to succeed R. G. Hopkins. Mr. Hopkins was transferred to London as manager of the chemical products department of Shell Petroleum Co.

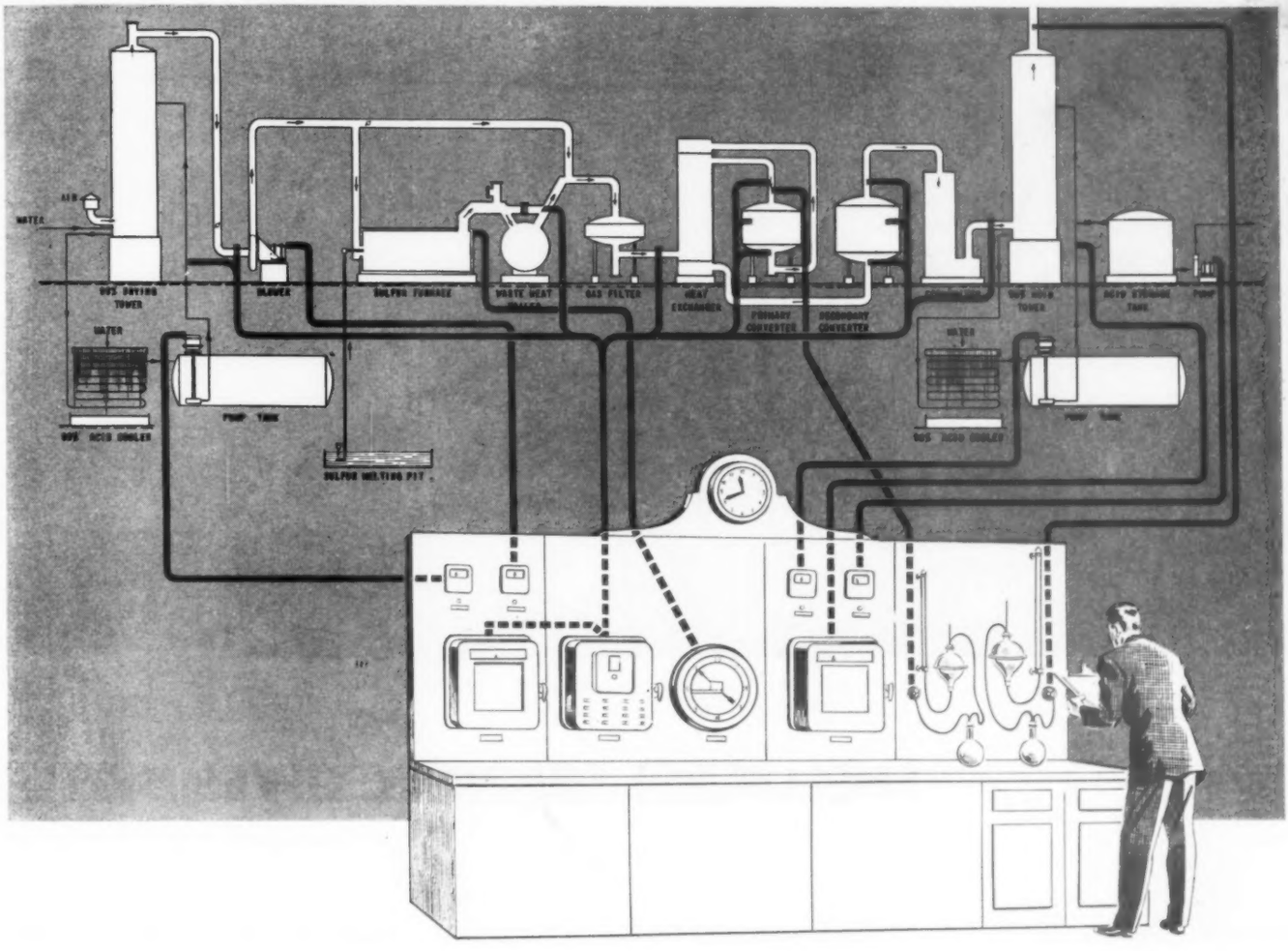
Mr. Avery joined Shell in 1930 and was sent to North China. In 1939 he was transferred to Australia as assistant general manager and, in 1946, acting general manager. He also served as chairman of Shell (Queensland) Development Pty. Co., Ltd., which recently undertook an extensive exploratory campaign in Queensland.

H. W. ROCKE has been appointed chairman of Vacuum Oil Co., Ltd., London, England, effective Jan. 1. He has been associated with the company 15 years. In 1933 after 16 years' service with Price Waterhouse and Company, London, chartered accountants, Mr. Rocke joined Vacuum as an assistant accountant. In 1936 he was appointed chief accountant, and two years later also took over the duties of secretary. He was elected a member of the board in 1941, responsible for works operations and finance. In October, 1946, he was appointed managing director of the company.

H. W. Rocke

It Takes One Man

TO OPERATE A CHEMICO ACID PLANT



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CC-140

Left: Aerial view of Shell's new refinery at Vancouver, B. C.

Right: Two views of the marine service station operated in Vancouver harbor by Shell for servicing luxury yachts such as the Malibu Tillicum, fishing boats, tugs and other commercial craft. The station is a steel barge equipped with accessories as well as fuels.

Extreme upper right: Crude for the Shellburn refinery is brought to the company's dock in ocean-going tankers.

Extreme lower right: Close-up of still and fractionating towers.

SHELLBURN REFINERY GIVES BRITISH

THE first modern postwar refining unit to be erected in British Columbia is Shell's new $1,500,000 cracking plant at Shellburn in Burnaby on the outskirts of Vancouver, Canada's largest Pacific Coast city. In designing the plant advantage has been taken of wartime advances in refining and construction methods to give the Canadian West Coast a thoroughly up-to-date refinery, the only one with a polymerization plant. With its new facilities the company is able to produce a premium gasoline regardless of the type of crude available.

Located on the south shore of Vancouver harbor, the 70-acre refinery site is only seven miles from the company's head office in the city's business center. Set among timbered hills directly across from the 5,000-foot mountains that line the inlet's northern shore and with its broad terraced slopes reaching to the water's edge, the refinery provides a striking study in modern industrial development. Deep water and large wharfing facilities permit the unloading of the largest ocean-going tankers.

Included in the postwar Shellburn plant which was constructed as an addition to the original refinery built in 1932 are the following units: a Foster-Wheeler installation for topping and distilling, thermal cracking, stabilization, UOP catalytic polymerization of stabilizer overhead gas, gasoline chemical refining and redistillation units and gasoline sweetening. These facilities produce high-grade motor gasoline and fuel oil from high-pour, waxy, straight-run residue.

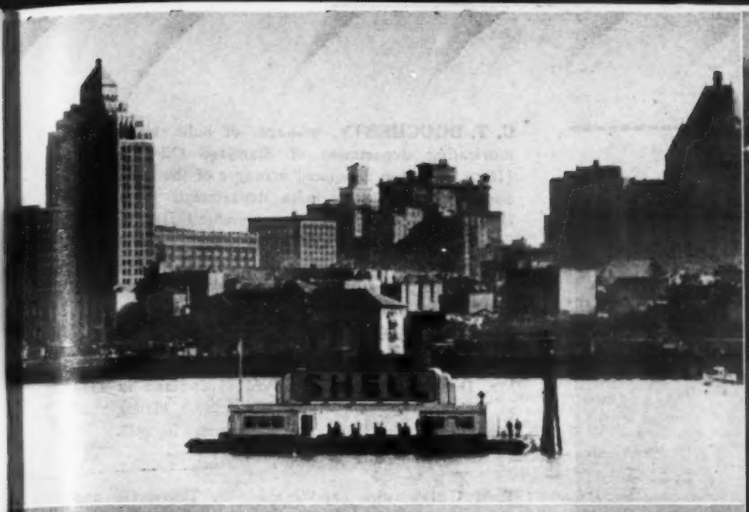
Particularly proud of Shell's Pacific Coast development is N. Y. Knox, vice president and general manager of Shell Oil of British Columbia, Ltd., who describes the finished plant as "one of North America's most modern oil refineries." Variations of refining skills developed during the closing years of the war are employed. G. L. Gardiner, twenty years with Shell, is manager at Shellburn.

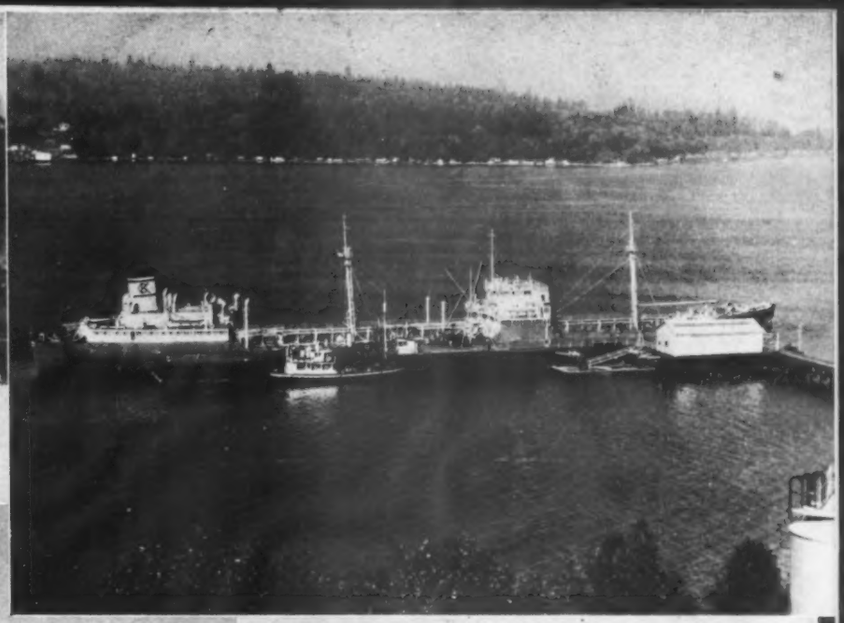
Crude oil capacity at Shellburn is 4,500 barrels per stream day, while the cracking plant capacity is 2,200 barrels per day.

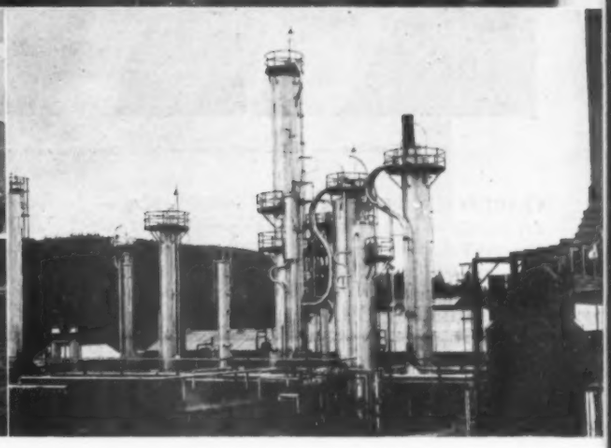
Construction work at the Shellburn extension was supervised by Fluor Corporation of Los Angeles, engineers and designers. Practically 100 percent of the several hundred men who worked for nearly a year on the construction were local workmen. Fluor engineers and supervisors where highly pleased with the ability and willingness of the Canadian workers.

On the job during various phases of the building were Fluor's Bill Vann, superintendent; John Prospal and Rex Lasson, assistant superintendents; "Frosty" Heavilin and Cohee Smith rigger foremen; Herb Smith, job engineer; Owen Gaudern, purchasing agent; Kenneth Eldred and C. J. Ronsheimer, welding foremen; Milt Lemoine, accounting superintendent; Nate Cawthorn, project engineer, Ted Weaver, process engineer; and William Lockett, electrical foreman.

The Fluor men were rather sorry to see the end of their task in November, 1946, after eleven months' work. They enjoyed being "on location" on the shores of crystal clear Burrard Inlet (Vancouver harbor) and appreciated to the full the leisure moments which gave them time to fish in mountain streams near Vancouver and







COLUMBIA NEEDED FACILITIES

By Don Tyrell

enjoy the scenic beauties of the coastal town. Oil often crops up in desolate and uninviting spots, and the engineers and other specialists appreciate the opportunity of working in pleasant surroundings when it presents itself.

With the facilities available at Shellburn before completion of the cracking and polymerization units, California crude oils were heated by an oil-fired furnace and distilled in a fractionating column. The gasoline distilled from the crude, straight-run gasoline, was the main component of motor gasoline blends. After chemical treatment, this gasoline was tested by laboratory inspectors, blended with casinghead gasoline to meet seasonal volatility requirements and then leaded. In addition to providing the base stocks for premium and regular motor gasolines, the distillation produced naphtha, stove oil, diesel oil and heavy fuel.

In the cracking process in the new refinery, the heavy fuel resulting from distillation of crude is subjected to temperatures as high as 925°F and pressures of 300 pounds per square inch. This technique provides cracked gasoline and light hydrocarbon gases, butane and propane.

Straight-run gasoline, cracked gasoline and polymer gasoline, all fully refined, are stored in separate tanks, withdrawn as required and blended to meet seasonal requirements, then leaded.

An important marketing outlet which Shell has developed in British Columbia is the marine service system that brings supplies within easy reach of fishermen, loggers, mill operators, prospectors and miners along B. C.'s 7,000 miles of coastal fiords. To the fishermen whose catches form a major B. C. industry and provide payrolls to thousands, the maine service stations are particularly important. Without these conveniently located refueling barges and shore stations, the fish boat skipper would lose valuable time and money. Besides furnishing coastal navigators with gas and oil, the marine stations act as a clearing house for all types of information. Skippers check on the location of their friends, leave messages to be forwarded and telephone home from the barges in order to save time.

Gasolines. diesel fuels, lubricants and greases are freighted along the marine highways in all kinds of weather to supply every type of industry along the coast. Modern scows are now replacing the older float and shore installations that pioneered marine service on B. C. waterways.

The new marine stations bring to the seafarers everything to be found at the well equipped roadside service station. Shell's latest barge, in use at Coal Harbor, part of Vancouver harbor, is of the new corrugated steel construction which was introduced at Waterways, Alberta, by its builders, West Coast Shipyards of Vancouver.

It has high-speed pumps for dispensing gasolines, diesel and bunker fuels; special vacuum and pressure equipment for oil changes; fully equipped tool room and battery-charging room with lead floor. Drums are stored below decks and elevated to the main deck by hydraulic lift.

One of the finest features of this seaside super service station, as far as the fishermen are concerned, are the hot showers available to them after several days' fishing. Restrooms are clean; fresh water and telephone service are provided.

OIL COMPANY STAFF CHANGES

Clarence S. Beesemyer

Philip S. Magruder

CLARENCE S. BEESEMYER and Philip S. Magruder have been elected executive vice presidents of the General Petroleum Corporation. Both men have been vice presidents and directors of General Petroleum, with Mr. Beesemyer serving as director of marketing and Mr. Magruder as manager of the manufacturing department.

Mr. Beesemyer, who was 1947 president of the Los Angeles Chamber of Commerce, the nation's largest organization of its kind, has spent his entire business career on the Pacific Coast. He entered the oil business in 1912 as a general worker, progressing through various promotions to become vice president and a director of the A. F. Gilmore Co. in 1918 and president of Gilmore Oil Co., a successor company, in 1944. When Gilmore was taken over by General Petroleum a year later, he became director of marketing and a vice president of General Petroleum.

Mr. Magruder joined General Petroleum in 1925 as a tester at the concern's Vernon plant. Subsequently he became a gas engineer at Santa Fe Springs, returning to Vernon in 1929 as general superintendent of the gas department, followed by advancement to assistant manager and member of the manufacturing committee. He transferred to the company's home office in 1945 and soon thereafter was made manager of the manufacturing department. In 1945 he was elected a director and the following year, a vice president.

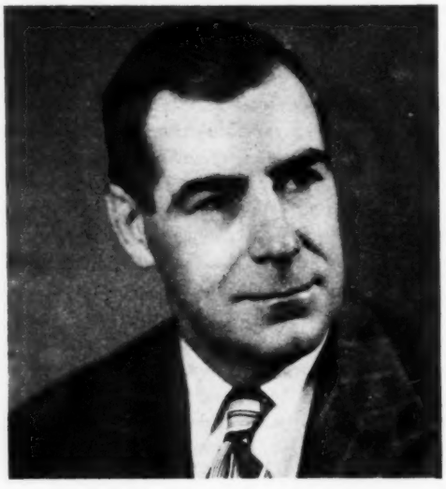
EDWARD J. SNOW, of the automotive engineering division of the lubricating department of Socony-Vacuum Oil Co., has retired. Joining Socony in 1922, Mr. Snow was responsible for laying down supplies for such famous airplane flights as the U. S. Army round-the-world flight in 1924, Doolittle's over-the-Andes flight, Byrd's North Pole flight in 1926 and the plane tour that followed it. Lindbergh's New York to Paris flight and his ensuing tour of the United States, the Pan-American tour in 1927-28, the first California to Hawaii flight in 1927 and the tour made by the German flying boat DO-X. He also acted as manager of the automotive engineering division during the war years.

DON O. CHAPELL, division geologist for Sunray Oil Co., San Antonio, Texas, has been named a vice president and will direct a new department of exploration at Tulsa. The appointment is the company's first step in a new program of activity, and expansion which Sunray plans in the mid-continent and California. H. S. McClintock, vice president, will continue to direct Sunray's land department. Sunray now maintains land and geological offices in Wichita, Kansas, Shreveport, La., Oklahoma City, San Antonio and Midland, Texas, and Los Angeles, Calif.

ALLEN S. JAMES has been appointed assistant to the president of Warren Petroleum Corp. on Jan. 1. Mr. James brings to his position a background of more than 20 years of newspaper and magazine reportorial experience and over seven years of varied experience with Warren.

Mr. James was in charge of the mid-continent bureau of National Petroleum News at the time he resigned on July 1, 1940, to join the Warren organization. After gaining experience in various departments of the corporation, he was sent to Washington late in October of 1941, where he spent most of his time until August of 1947 in liaison work between the corporation and various war agencies of the government. During the acute pressure tank car shortage in the winter of 1946-1947, he was one of the leaders in the liquefied petroleum gas industry's successful fight to keep several hundred government-owned propane tank cars in its service despite repeated efforts by the Army to obtain the cars for use in its program to manufacture fertilizer for conquered countries.

Allen S. James



G. T. DOUGHERTY, manager of bulk sales in the lubricating department of Standard Oil Company (Ind.), has been appointed manager of the lubricating and sales technical service departments to succeed Dwight F. Benton, who, as announced Dec. 17, has resigned to become president of Root Petroleum Co. W. Wayne Albright, assistant to the manager of the lubricating department, has been appointed assistant manager of the lubricating and sales technical service departments.

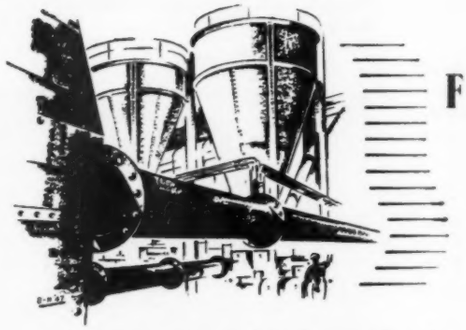
Mr. Dougherty joined Standard of Indiana in 1919 as a lubricating engineer. He became manager of bulk sales in the lubricating department in 1939.

T. M. CADY, vice president of the Texon Oil and Land Co., Fort Worth, has been named division land superintendent for Continental Oil Co. at Fort Worth. He succeeds W. C. Stout who recently assumed new duties in Houston as assistant manager of Continental Oil Company's land department in charge of the southern region. Mr. Cady retains his position with the Texon Oil and Land Company, a Continental subsidiary, in addition to his new duties.

DR. J. BENNETT HILL and Dr. John M. Pearson have been made directors of new divisions in the recently-created research and development department of Sun Oil Co. Dr. Hill, former manager of the development division of the manufacturing department, will head a new chemical and engineering division. In this division Stewart S. Kurtz, Jr., will be manager of the chemical research laboratory, W. Herman Barcus will manage the development laboratory, and A. Ludlow Clayden will manage the automotive laboratory. Dr. Pearson, former director of physical research and development of the production department, will direct a newly-organized physical division. Laboratory manager of the physical division will be Ford L. Johnson.

WILLIAM H. KERSHAW, assistant general sales manager of The Texas Company, retired Dec. 31 after 37 years of service with the company. Mr. Kershaw began his career with the eight-year-old Texaco organization in 1910 as a road engineer. Two years later he became manager of the company's paving and roads division, later known as the asphalt sales department. Under his guidance, The Texas Company became the largest manufacturer of asphalt and roofing products in the world. He was appointed assistant general sales manager in 1936. During the war he was in charge of Texaco's domestic sales and served on many petroleum industry committees. For years Mr. Kershaw has supervised the company's advertising activities, particularly in the field of radio.

William H. Kershaw



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FRANK W. LOVEJOY has retired after 25 years' service with the Socony-Vacuum Oil Co. He was manager of the automotive department and a member of the lubricating oil marketing committee. Mr. Lovejoy is president of the Sales Executive Club of New York City, a member of the Sales Managers Club, life member of the Royal Society of London and American Association for Advancement of Science, and will continue to fulfill speaking engagements before business groups.

BERTRAM C. VOSHELL, manager of the Socony-Vacuum Oil Co. technical division of the lubricating department, has retired. He joined the Vacuum Oil Co. in 1916 as assistant manager of the Boston branch and came to New York City in 1919 as assistant manager of the engine builders branch. He became assistant manager of the technical department in 1922 and manager in 1930. He was appointed manager of the Socony-Vacuum technical department, now the technical division of the lubricating department in 1932.

A. A. BUZZI has been appointed assistant treasurer of Shell Oil Co., Inc. Formerly manager of the accounting department, Mr. Buzzi replaces William H. Garbade who recently became president of the Deep Rock Oil Corp.

H. L. SCHULTZ, a vice president and director of Standard-Vacuum Oil Company, retired Jan. 15 after 36 years of service. He joined Standard-Vacuum as a foreign service trainee in 1911 and spent about 30 years in Far Eastern marketing operations before returning to New York to become a director in December, 1941, and vice president in January, 1944. Mr. Schultz has served as manager at Singapore and Hong Kong in China, and as manager for the Netherlands Indies.

William H. Garbade

WILLIAM H. GARBADE, assistant treasurer of Shell Oil Co., has been elected president of the Deep Rock Oil Corp. to succeed C. K. Baxter, who had served as president pro tem since the death of Henry N. Greis in July, 1947. Mr. Garbade succeeds Jason L. Honigman as director of the corporation, and Mr. Baxter will continue in his capacity as chairman of the board.

Holding a master's degree from the New York University School of Commerce, Accounts and Finance, Mr. Garbade has had fifteen years' experience in different branches of Shell's operations, including marketing, transportation and supplies, organization work and economics, in addition to financial and accounting activities. He also participated in the reorganization of the distribution system of Shell Group companies in Western Europe in 1946 following the end of the war.

DR. J. ELSTON AHLBERG has recently joined the research staff of the Davison Chemical Corp., Baltimore. For the past eleven years he was associated with the Universal Oil Products Co., Chicago, and was particularly active in the development of methods of manufacturing cracking catalysts.

Hollis B. Fairchild

Hollis B. Fairchild, 55, general manager of marketing department operations, Standard Oil Co. of Calif., and president of the California Asphalt Corp., died Dec. 26 after a brief illness. Mr. Fairchild joined Standard of California in 1913, serving in a number of sales capacities throughout the company's marketing area. He became general manager of operations in the marketing department in 1941, and was named president of the California Asphalt Corp. when it was organized in early September, 1945.

New Canadian Field

Discovery of a new oil field in Eastern Canada was indicated Jan. 5 when a well being drilled for Imperial Oil, Ltd., about five miles southwest of Tilbury came in with a pressure that blew the tools out of the hole. Gas flow was estimated at 300,000 cubic feet daily, and preliminary tests indicated a flow of six barrels per hour of 38 gravity crude oil. Production is from a depth of 1169 feet. The well was located on the basis of geological data which the company has been assembling during the past six or seven years and is the second oil discovery and third gas discovery resulting from that program.

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W. R. Ryburn

National Supply Manager

W. R. Ryburn has been appointed manager, drilling equipment sales of the oil field machinery and equipment division, National Supply Co. He will make his headquarters in Toledo, Ohio. He joined the company in 1928 after several years in the Montana and Wyoming fields and served as store man in National's Shelby and Conrad, Montana, stores and as field salesman in their Casper and Cody, Wyoming, stores. In 1938 he was transferred to the general sales department at Toledo.

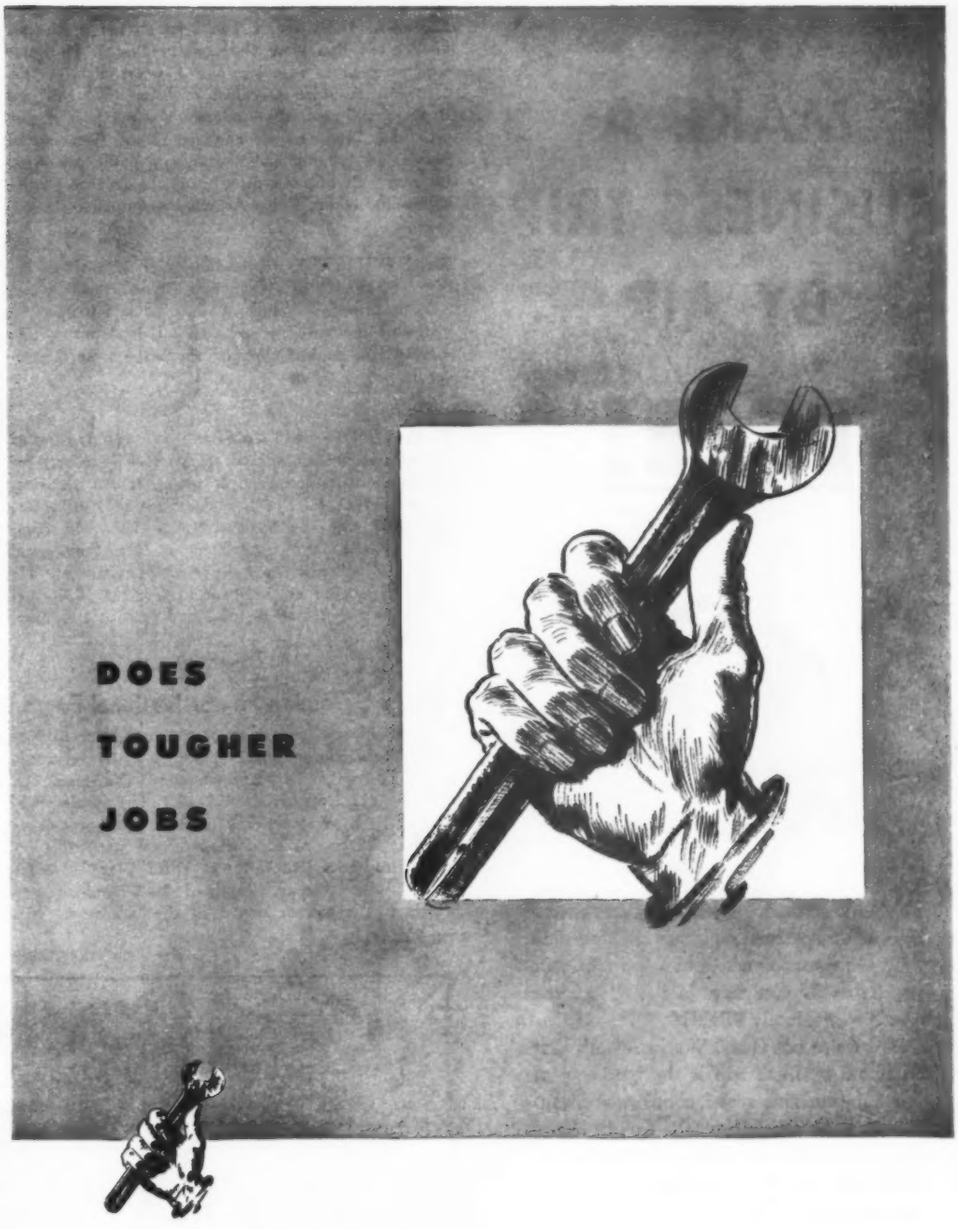
Polymerization of Acetylene

Polymerization of Acetylene to Cyclooctatetraene, by Karl Kammeyer; Hobart Publishing Co., Washington, D. C.; 113 mimeographed pages, with flow sheets and drawings of equipment; $17.50.

This is an English version, with additions, of documents uncovered by agents of the Office of Technical Services in their interrogation of German scientists. In general it deals with the preparation of cyclic polyolefins, with particular reference to cyclooctatetraene, a mother substance for styrene which is used in compounding high-octane aviation gasoline.

De Olen Pugh

De Olen Pugh of the Byron Jackson Co. died suddenly January 11 at his home in Tulsa, Oklahoma. Mr. Pugh was born in Ranger, Arkansas, March 31, 1901. His family moved to Tulsa in 1929. He came to Byron Jackson Co. from Dunn Manufacturing Co. which he joined in Tulsa in 1926. He served the petroleum industry in Oklahoma, Texas, Kansas, Illinois and Indiana.



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All we ask in return is a few minutes during the flight to explain to you how the 150 mph *Navion* costs no more than a car to drive, and how businessmen everywhere are finding that this rugged, safe, easy-to-fly plane is a money-maker for them.

You are, of course, under no obligation to us. If you're interested in either a business trip or an airport demonstration, drop us a note on your business letterhead, and we'll have our nearest dealer get in touch with you.

NEW Navion By RYAN

RYAN AERONAUTICAL COMPANY

1902 Lindbergh Field, San Diego 12, California

HUGO A. ANDERSON has been elected a director of Warren Petroleum Corp., succeeding J. H. Boyle who resigned as an officer and director, effective Jan. 1, 1948. As vice president of The First National Bank of Chicago, Mr. Anderson for the past twenty years has been actively engaged in the financing of production, refining and distribution in the petroleum industry. He also is a director of The Chicago Corporation and of the Union Asbestos and Rubber Co.

EARL WHATLEY of the lubrite division of the Socony-Vacuum Oil Co. has been transferred to New York to become manager of the product purchase division of the gasoline and fuel oil department. He succeeds C. B. McCollough who retired on December 31.

W. C. STOUT has been named assistant manager of Continental Oil Co.'s land department in charge of the southern region with headquarters in Houston. He succeeds A. K. Tyson, who has resigned to become associated with the Barber Asphalt Co. Mr. Stout was division land superintendent for Continental at Fort Worth prior to the present appointment. He first entered the oil business in October 1919, and joined Continental as district land man at Lafayette, La., in 1939.

Hart H. Fleming Heads National Foam

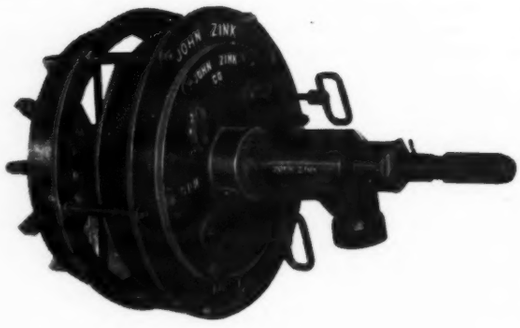
Hart H. Fleming has been elected president of National Foam System, Inc., Philadelphia. He succeeds Fisher L. Boyd, who has been named chairman. Mr. Fleming joined Standard Oil Co. of N. J. as an engineer at its Bayway refinery in 1917. He spent three years in Europe as chief engineer of Standard's refinery properties shortly after World War I. Work there included the rebuilding of the Ploesti refinery which was again destroyed in the last war. Mr. Fleming has been a vice president of National Foam since 1944, has served as a director of the company for 18 years and as a vice president of Johnston and Jennings, Cleveland, since 1925.

Hugh G. Voorhies, Jr.

HUGH G. VOORHIES, JR., of San Diego, Calif., is conducting basic research in nuclear physics at Harvard University under a fellowship granted by Shell Oil Co., Inc. The fellowship is one of 44 granted by Shell. Chief aim of the particular research in which Mr. Voorhies is engaged is to find out more about the nature of cosmic radiation. Discovery of additional fundamental particles such as the positive electron may be possible as a result of research in connection with Harvard's new cyclotron.

—JOHN ZINK—

C B M BI-MIX BURNER



The John Zink BI-MIX GAS BURNER has been combined with a Steamizer type Oil Burner to produce a highly efficient COMBINATION oil and gas burner identified as Series CBM. It provides approximately the same heat pattern when firing either or both fuels in combination.

Uses steam or high pressure gas for oil atomization.

Burns any properly prepared commercial grade of fuel oil, and any gaseous fuel at pressures in excess of 5 lbs.

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AXELSON

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

DEEP WELL PLUNGER PUMPS AND SUCKER RODS

Three Cooper-Bessemer Executives Promoted

The Cooper-Bessemer Corp. has announced the elevation of three of its sales executives to positions of vice president. Those so honored, in recognition of their outstanding sales achievements and their many years of service, include J. W. Reed, Atlantic Coast manager of gas engine and compressor division; A. A. Burrell, southwestern district manager, Dallas; and B. L. Potter, mid-continent manager, Tulsa, Oklahoma.

Stone & Webster Purchase Badger Co.

Announcement was made January 15 that Stone & Webster, Inc., had purchased E. B. Badger & Sons Company. Object of the purchase was said to be the desire to expand the engineering and construction activities of Stone & Webster Engineering Corporation in processing and industrial fields. For immediate future, at least, the two companies will be operated as individual entities. Both have important contracts under way in the United States and other countries.

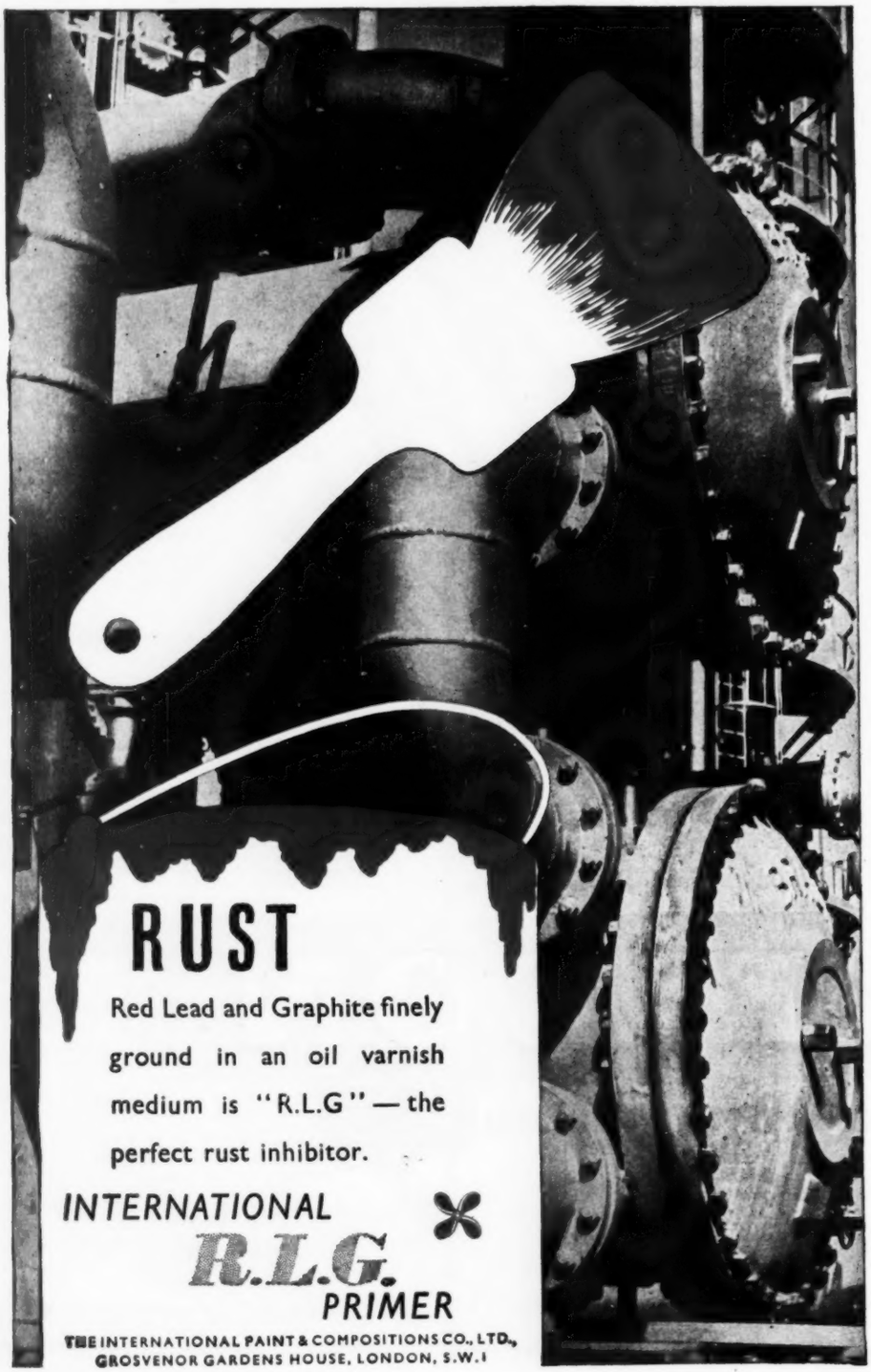
The Badger company has been in continuous operation for more than a century and is widely known for its engineering activities, having designed and constructed many outstanding plants for the oil and chemical industries. Erastus B. Badger, president of the company, is a grandson of the founder.

Esso Export Corp. Formed

The Esso Export Corporation, formerly known as Standard Oil Export Corp., has taken over the international marine fuel sales previously handled by Standard Oil Co. of N. J. Name of the company was changed to Esso Export at the same time.

L. K. Blood, formerly executive assistant in foreign marketing coordination of the Jersey Company, has been elected executive vice president of Esso Export; W. W. White, formerly president of Intava, Inc., has been named vice president and director in charge of international aviation activities; John J. Steitz, Jr., formerly of Standard Oil Company of New Jersey, vice president and director in charge of international bunker fuel oil business. H. W. Weller, vice president and director, continues in charge of supplies and transportation.

JAMES J. COSGROVE was elected chairman of the Continental Oil Co. at a meeting of the board of directors on Jan. 21. Mr. Cosgrove has been with Continental since 1929. He was admitted to the bar in 1912 and practiced law in Pittsburgh until 1917 when he entered the army. After the Armistice he became a member of the War Department board of appraisers and subsequently a member of the War Department claims board. In 1921 he was appointed special attorney to the Commissioner of Internal Revenue and in 1922 joined The Texas Company, where he acted in a legal capacity until he became general counsel for Continental in 1929.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Red Lead and Graphite finely ground in an oil varnish medium is "R.L.G" — the perfect rust inhibitor.
INTERNATIONAL
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TENDER FOR OIL REFINERY AT BAIJI FOR IRAQ GOVERNMENT

Notice is hereby given that the last date for receiving tenders for the above refinery is extended till noon of 30th April 1948.

Tenders must be in duplicate enclosed in a sealed envelope and dispatched by registered post addressed to "The Director General of the Ministry of Economics, Baghdad."

It has been decided to enter some modifications in the general conditions of the contract documents. The text of amendment can be examined at any of the following offices:

a) The Ministry of Economics, Baghdad

b) The Royal Iraqi Embassy, 22 Queen's Gate, London, S.W. 7

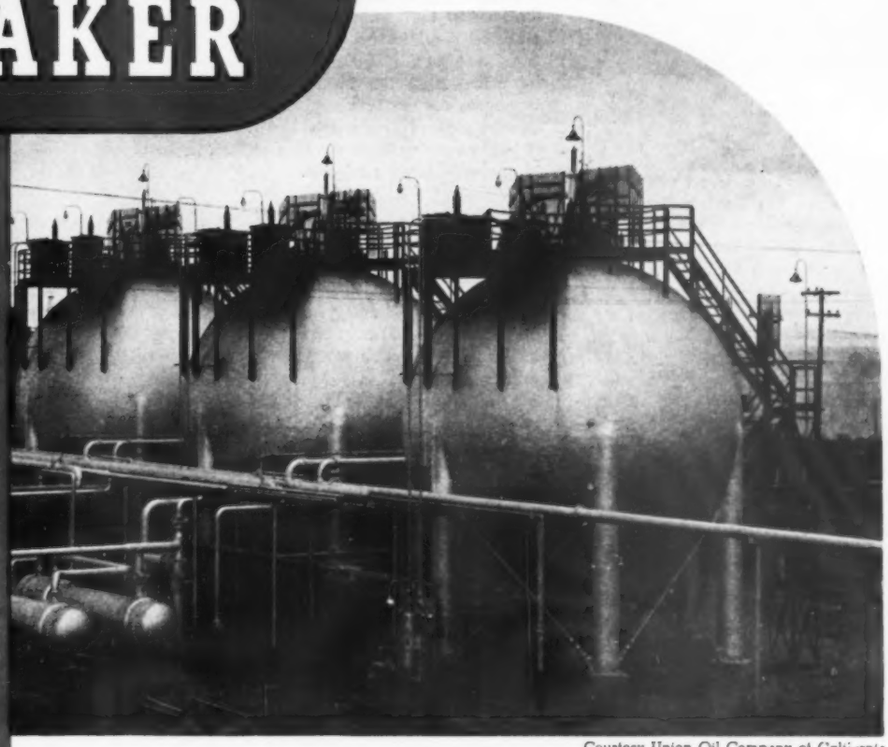
c) The Royal Iraqi Embassy, Washington, D. C.

d) The Royal Iraqi Consulate General, 36 Riverside Drive, New York City

Minister of Economics

SALT SHAKER

KING SIZE...



Courtesy Union Oil Company of California

A Petreco Electric Desalter doesn't exactly *shake* out the salt, but it sure gets rid of it–right now. Most Petreco desalters are getting 90% or better removal–98, 99 and 100% removal efficiencies are not unusual. Desalting eliminates the nuisance of frequent refining shut downs caused by salt plugging, hard coking and HCl corrosion. Desalting insures greater capacity, longer runs, and smoother operations. If you're having any salt difficulties, get in touch with us. We've helped some mighty good refining men shake the salt problem out of their hair. *The Petreco process is not expensive;* a Texas refiner recently figured his Petreco desalter paid off in less than six months. Get in touch with a Petreco engineer–he'll show you the figures!

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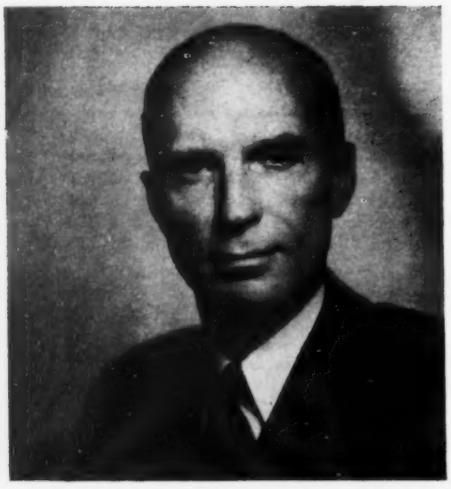

Howard B. Nichols

HOWARD B. NICHOLS has been elected vice president in charge of refining of The Bahrein Petroleum Co., Ltd., and assistant vice president in charge of refining of California Texas Oil Co., Ltd. Mr. Nichols has been engaged in petroleum refining since 1923. During the early thirties he specialized in cracking processes, and for seven years was in charge of all plant and laboratory research and development work on cracking and related refining processes. He assisted in the design of the Bahrein refinery, which began construction in 1936, and became manager of research and development of The Bahrein Petroleum Co., Ltd., in January 1938. In 1944 he was elected assistant vice president of Bapco.

Pew Foundation Formed

The Pew Memorial Foundation dedicated to religious, charitable, scientific, literary and educational purposes has been formed with a gift of 880,000 shares of Sun Oil Company common stock by the four children of the late Joseph M. Pew and his wife Mary Anderson Pew. The foundation was created in the memory of Joseph N. Pew, founder of Sun Oil Company, and his wife, Mary Anderson Pew. The children are Miss Mary Ethel Pew, Mrs. Mabel Pew Myrin, J. Howard Pew and Joseph N. Pew, Jr.

Possible Oil Bearing Areas in Uruguay

Silvio Moltedo, director of ANCAP, organization in charge of all Uruguayan oil activities, has released information that according to geological studies the presence of oil in the subsurface of the country has been confirmed and that there are indications of its existence in the Parana Basin, Artigas, Salto, Paysandu, the northern section of Rio Negro and the western parts of Tacuarembo and Rivera. The drilling of exploratory wells in the area of the Merino lagoon is also considered advisable.

Melling Retires

Thomas William Melling, M.B.E., retired as works manager of the East Hecla and Hecla works of Hadfields Limited on Dec. 31 after nearly 50 years' service with the company. Mr. Melling became associated with Hadfields Ltd., in July, 1898. He was made production manager in 1912. Much responsibility devolved upon him during the 1914-18 war, and he received the award of M.B.E. for his outstanding work in connection with armor piercing shells.

A. D. Puckett Joins Du Pont

Aften D. Puckett, widely known in the petroleum industry for his work in anti-knock properties of motor fuels for the government, has joined the Du Pont company's petroleum chemicals division. Mr. Puckett has been put in charge of operations of all anti-knock equipment in connection with Du Pont's entry into the direct marketing of tetraethyl lead compounds. He will be stationed at the Engineering Laboratory at Deepwater Point, N. J. Since graduation from Oklahoma A. & M. College in 1936, he has been associated successively with the Tide Water Associated Oil Co., the National Bureau of Standards and the Bureau of Mines Petroleum Experiment Station.

A. D. Puckett

Here's the Story
Not the full story, we admit; it does not concern itself with detailed technical information but it does illustrate the flexibility of the Callender-Hamilton Bridging System for road, rail, foot or cable-carrying bridges in any part of the World. Write for publication No. 206 J on Callender-Hamilton Bridges.
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